THE METAL INDUSTRY

WITH WHICH ARE INCORPORATED THE ALUMINUM WORLD, THE BRASS FOUNDER AND FINISHER AND ELECTRO-PLATERS REVIEW.

A TRADE JOURNAL RELATING TO THE NON-FERROUS METALS AND ALLOYS.

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BRITISH VS. GERMAN BRASS WORKERS.

Another instance of the investigating tendency which has lately been so much in evidence in England among persons connected with the manufacturing industries in regard to finding out what is done in their respective line of business in other countries, is furnished by a report made by a committee of gentlemen interested in the Birmingham brass industry. They went to Germany in order to compare the general status of the German workmen in regard to their training, efficiency, habits, etc., with that of the British workers and especially those in Birmingham. Their report is on the whole more or less unfavorable to the British workman as compared with his continental competitor. The investigation was mainly concerned with the condition of the brass workers in the city of Berlin, where there are 18,000 brass and zinc workers working at those trades out of a total of 50,000 brass and zinc workers in the whole of Germany. The workmen receive in wages from $7.50 to $10.50 a week, the hours of work being from 7 A. M. to 5 P. M., half an hour being taken for breakfast and dinner. Piece work is stated to be common and the ventilation of the shops, the carrying off of the noxious fumes, dust, etc., is being carried out to a considerable extent, owing to the very stringent requirements of the German Government in that respect. The Government has within recent years been paying considerable attention to the safeguarding of the health and comfort of workmen in general and the laws passed to that effect are rigidly enforced. The men therefore work generally under better conditions and they possess more comfortable homes, etc., than their brothers of the craft in Birmingham. Some of the conclusions which the authors of the report come to are quite interesting. They state for instance that the finish of the work of Birmingham manufacturers, particularly their polished brass work, is most excellent and that designs and models are also excellent as long as they are confined to the reproduction of plain articles as characterized the national British styles in models, which may be produced without plastic treatment and without help from the trade artist in wax and plaster. If the manufacturers, however, want to compete in the German, French or Italian styles they find a dearth of artists to get up the designs and models. Such artists, however, are supplied in Berlin by the excellent training schools and they find plenty of employment, their work being supplemented by

the efforts of workmen who have been systematically trained in the requirements of the art of casting and finishing the articles. The interesting conclusion is reached by the investigating committee that it is on the intellectual side, that Birmingham requires to adapt itself to changed conditions; not to cheapening its wares, but to get more conception into them. The latter desideratum used to apply also to the United States, but happily now we seem to have entered a period and be already pretty well advanced in it, in which the artistic taste of the general public is becoming developed and where even articles of common use are required by the buyers to have an artistic appearance and finish. There is no doubt that in these lines progress will be made rapidly, with characteristic American push; and that in the not far distant future there will be produced in this country artistic work in the casting and finishing of numberless objects, such as there is none better anywhere in the world.

PRODUCTION AND CONSUMPTION OF COPPER IN 1904.

Owing to the prominence which the United States hold as a producer and consumer of copper, statistics concerning this metal are always of considerable interest. In the latest data covering the production of the metal during the year 1904 issued by the U. S. Geological Survey, the remarkable position of the United States as the main producer of copper in the world is clearly shown. During that time this country produced a total of 362,739 long tons of copper, while all the European countries together only produced a total of 90,820 tons, and South America had 41,265 to its credit. Germany produced nearly 21,000, Spain about 45,000, and Great Britain 500 tons of copper. This country has therefore actually become a provider of copper for the whole world, and considerable quantities of that metal are exported to almost all industrial countries. The exports of copper of the United States increased considerably in 1904 as compared with the figures for 1903, inasmuch as the quantity exported was 310,729,524 pounds of bars, sheets and old copper. The consumption of copper in the United States decreased to a certain extent, as according to the estimated returns it was 526,429,885 pounds in 1903, as compared with 482,190,920 pounds in 1904. The general feature during the latter year, as far as the copper market was concerned, was the steady maintainance of high prices, which have since still further gone up. The apparent consumption of copper in England during 1904 was 55,888 long tons, while the total amount imported in bars, cakes, etc., was 88,282 bars, of which the United States furnished 47,663 tons, as compared with 19,255 in 1903 and 43,632 tons in 1902. The total imports of copper in England and France from the United States in 1904 were 91,855 tons. The country next to the United States in regard to the consumption of copper, is Germany, and the statistics show that in less than ten years the consumption of copper in that country has practically doubled. The figures show also a considerable increase in consumption for the year 1904. Whereas in 1903 the consumption of copper for manufacturing industries was 117,000 metric tons, which included 18,000 tons in rods and sheets for copper rolling mills and 32,500 tons for brass rolling mills and wire works, it amounted in 1904 to 146,000 tons, including 23,000 tons for copper rolling mills and 37,000 tons for brass rolling mills and wire works. A further increase of consumption is shown by the copper used in ship yards, railroads, for casting alloys, German silver, etc., which in 1903 amounted to 18,500 tons, while in 1904 these trades absorbed a total of 25,000 tons. The consumption of copper in the leading industries of the world affords also some very interesting information as to the general extent of the industries which utilize that metal as one of their main raw materials. The consumption in the United States for 1904 was 215,264 tons, while that of Germany was 146,006 tons; of England, 133,280 tons; of France, 64,234 tons; of Russia, 29,624 tons, and so on, the total for the whole world being 648,611 tons. The enormous extent of the copper industry in the United States is thus very clearly shown.

THE SILVER AND PLATE TRADE IN SHEFFIELD.

According to a recent statement in the *Ironmonger*, the condition of the silver and plate trades is causing grave concern in Sheffield, for the present depression is regarded as the worst on record. Ever since the war started in 1899 the output of the silver works has undergone a constant diminution, and there has been no relief to the monotony of its downward course. Some authorities are beginning to express the conviction that the silver trade of Sheffield has seen its best days. The business attained high-water mark during the five years preceding 1899. The output of massive and expensive silver goods during that period was enormous. Money was abundant at that time, and many possessors of it regarded the purchase of silver bowls, services, sets, and trays as a good investment. This fact, together with the general depreciation of investments and lowering of incomes, is given as an explanation of the present unparalleled depression, and it is to be feared that there will be a lull of long duration in the purchase of heavy plate. The depression is felt all the more keenly from the fact that during the prosperous years makers were tempted to extend their premises at a great outlay of capital. Many of the local works are far too large and are overdone with machinery. The skilled workmen are suffering severely from the scantiness of their earnings, and some have emigrated to Canada. The cutlery trade is as bad as ever, and there is much underselling.

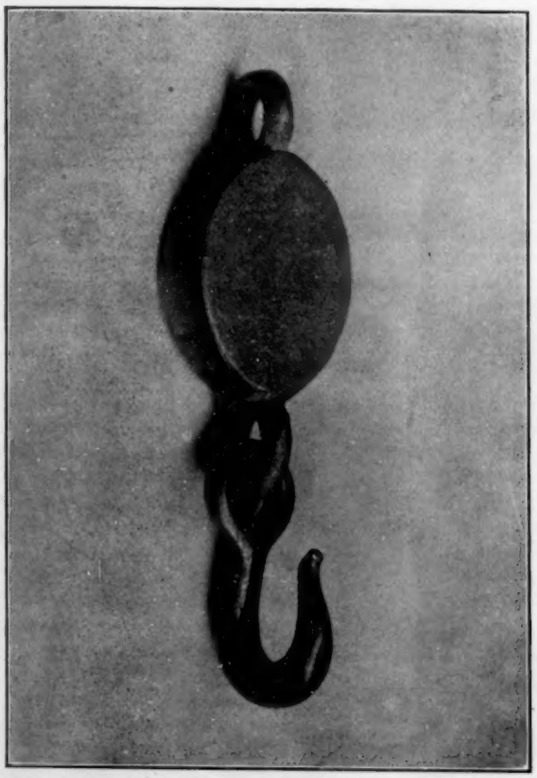
Our British correspondent reports that Birmingham manufacturers of brass working machinery have lately been doing a big trade with French brass manufacturers, the French people being very much alive to the value of modern metal working machines. It is also stated that the French manufacturer has of late been the most formidable competitor of the Birmingham producer of metal goods.

THE USE OF METAL PATTERNS IN THE BRASS FOUNDRY.

By E. F. Neumann.

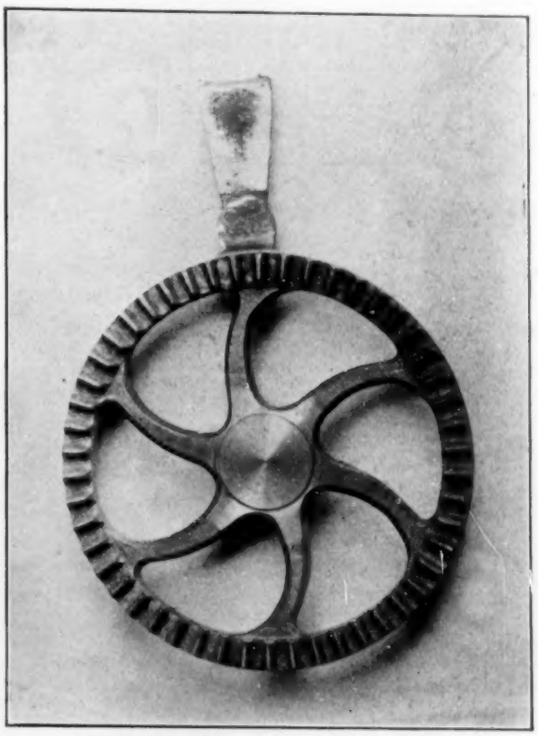
To those who are actually engaged in the making or using of metal patterns, most of what is said in the following is doubtless perfectly familiar and yet the fact that every foundry has to throw out so many poor castings as the result of poor pattern work or poor molding may make it not amiss to call attention again to some of the most important points. Those who have had little or no actual experience with metal patterns, but who employ them in their business, will find that careful attention to these important details will oftentimes result in a material saving.

The subject of the article is "The Use of Metal Patterns in the Brass Foundry," but the general principles of handling patterns in any foundry are so much alike, that most of what may be said is equally applicable to malleable iron and gray iron foundries. The chief advantages of metal patterns over wooden ones are their greater durability and the ease with which several patterns may be used on one gate, thus producing many more castings from a given amount of molding. Especially for work of medium and small size these advantages more than compensate for the higher first cost of metal patterns. Where, however, very large castings are to be made, the greater durability is of course counterbalanced by the excessive weight, and the inability to use more than one pattern in a flask destroys the second advantage. If only a few castings are to be made, one or two patterns, gotten up in the cheapest way consistent with good results will be necessary. These patterns can be made of wood, white metal, iron or any other metal, which can be easily obtained.



DROP FORGED HOOK INTO WHICH HAS BEEN CAST MALLEABLE IRON PULLEY BLOCK.

Many of the articles cast in a brass foundry are small and if only one pattern is used when there is room in the flask for many of them, there is a great waste of time. The molder needs as much time to fill and ram his flask if there is only one small pattern in the flask, as he does if the flask is filled to its capacity. To obtain the largest amount of work in a given time, it is evident, that the flask must be filled to the extent, in which it may reasonably be expected that every casting shall be good. Not only must the flask be filled with patterns to its capacity, but the patterns must be properly made. The draft must be right; the gating must be right. I cannot emphasize too strongly the importance of having the patterns "work well." No matter how skillful the molder may be, he cannot get good results if the patterns are defective in the draft. I sometimes have thought that proprietors of brass foundries do not realize the importance of having the flasks fit well and the patterns draw well. The molder is likely to be blamed when the fault is in the flask or the pattern or possibly in both.



GEAR PATTERN.

Again if the ears of the flask are worn so that the cope has play, the castings made in that flask are liable to be overset and in many cases useless. The cope should fit closely and move easily and smoothly off and on. Sometimes when a molder or a foreman calls attention to some difficulty either in the flask or pattern, the correcting of the trouble is postponed and then forgotten. The molder gets discouraged and says no more and gets along the best way he can, the result being a constant loss to the owner.

In making a pattern it is very important that particular attention be paid to the master pattern, so that the pattern castings shall need but little work done on them beside finishing the surface. To secure this desirable result the

master pattern must not only be correct, but the molder must understand his part thoroughly as well. The two classes of workmen so closely related to each other in their work as the pattern maker and the molder are and should be fullest sympathy with each other in their work. How often it is just the reverse! The molder cares nothing for the pattern maker and the pattern maker ignores the molder. I have had much to do with molders and have often found their suggestions and criticisms helpful, yet of course not all molders are suitable advisers for a pattern maker. Some years ago, when the writer was in charge of the pattern department of a large manufacturing company, a molder brought in a pattern for making iron butts, together with the match he had made for it and reported that the knuckles of the butts would not draw. The trouble proved to be that the match was not high enough on the knuckles. This, of course, prevented the sand in the cope from dividing in the proper place and when the pattern was drawn, the sand would "tear up" at that place. When his match was built up to the center of the knuckles he had no more trouble.

TRUNK PATTERN.

While so broad a subject as this can be only briefly discussed in so short an article, the points brought out would probably be generally considered those of most importance. Certainly a careful attention to them will go far towards securing desirable results in the work of any foundry.

The range of the term "brass" is very wide, inasmuch as alloys are included within it which vary in composition from 35 to 90 per cent. of copper and 10 to 65 per cent. of zinc. The industrial brasses are chiefly confined to those alloys possessing a decidedly yellow or yellowish-red color.

NEW ALLOY.

A new alloy, which is designed specially for the production of tableware or articles which have heretofore been made of Britannia metal, was patented on August 29 by A. E. Hobson, of Meriden, Conn., with U. S. patent No. 798,181. The inventor states that he has found by experiment, contrary to the view generally adopted, that manganese may be used in an alloy containing a high percentage of tin and that it may be used with the composition of metals usually employed for the production of Britannia metal, with beneficial results. He has found that manganese can form one of the metals in which a large percentage of tin is present, without deteriorating the tin. He also claims that the copper or antimony entering into the composition of Britannia metal may be dispensed with and manganese included in it, so that the alloy consists of tin, antimony and manganese or tin, copper and manganese.

In the usual composition which makes up Britannia metal, as small an amount as ¼ ounce of manganese to 100 pounds of the tin, antimony and copper, or to 100 pounds of the tin and one of the other metals may be used with beneficial results and this amount of manganese may be increased to as high as from five to ten pounds. The amount to be added varies according to the uses to which the metal is to be put, as the amount of manganese to be used in casting metal may be considerably less than that in sheet metal. In order to obtain the best results, it is, however, desirable to use only comparatively small amounts of manganese, varying from ¼ to 3 ounces to 100 pounds of the other metals.

A mixture composed of 109 pounds of tin, about 3 pounds of copper, about 9 pounds of antimony and about 3 ounces of manganese is stated to produce an entirely satisfactory composition. An alloy such as the one described is stated by the inventor to possess a greater strength than ordinary Britannia metal, and an increased ductibility. The metal is harder and tougher and its melting temperature is higher than that of Britannia metal. The grain is stated to be extremely close and the alloy, therefore, capable of taking a higher finish.

A SIMPLE WATER LACQUER FOR CHEAP DIPPED BRASS GOODS.

By Charles H. Proctor.

A very simple lacquer for protecting dipped brass or dipped silver goods, which are produced in endless variety—such as lamp burners, cheap gas burners, curtain fixture balls of the lower grade, and many other articles—may be made by dissolving 4 oz. imported white gelatine in one gallon of boiling water and using this solution as the lacquer. The goods are acid dipped or silvered in the usual manner, passed through boiling water and immersed in the water lacquer, which latter should be maintained at a very high temperature. The heating can be done by the aid of a water bath or coils of lead pipe through which steam is passed.

After lacquering, the superfluous lacquer should be shaken off and the articles should be dried on the lacquering heater in the usual manner as is done for lacquering goods. The gelatine comes in thin transparent sheets and costs 40 cents per pound; thus lacquer of this variety can be made for 10 cents a gallon. The writer remembers an expert brass dipper employed in a large Connecticut brass concern, which made a variety of cheap lamp burners, making up this lacquer and selling it to his concern for 50 cents a gallon. The formula is given with due reserve, so that those, who may wish, may try it.

THE ROLLING OF COMPOUND METALS.

By Louis Schulte.

The process of rolling nickel and nickel alloys as well as copper and copper alloys on steel or iron by the welding process has been invented about thirty years ago by Dr. Fleitman, of Germany, and was patented by him. In the works, which were established at the same time for carrying out this process this industry has been brought to a high state of perfection, as steel sheets plated with nickel or copper-nickel find considerable consumption in the industrial countries. House and kitchen utensils as well as hotel and all sorts of metallic goods are made from them and even the shells of the lead bullets of most of the military countries are made exclusively from this metal. After the patent had run out, other works in Europe have taken up this branch of manufacture, but only America has lagged behind. The American manufacturer and artisan pays still a high duty for articles which are not manufactured here, but which he could make himself. Thousands of articles which are to-day made in this country from iron and steel sheets and are stamped, pressed, ground, nickeled and polished could be stamped directly out of this metal and the metal industry would be, therefore, in a position to produce not only cheaper but also better metallic goods, such as hardware novelties, etc. The layer of nickel in the compound metal can be made of any desired thickness from 2 to 50 per cent, whereas, when the goods are nickel plated, the deposit is mostly very thin and the goods rust quickly. With the compound metal, however, which has received a sufficiently thick layer of nickel by the welding process, the rusting of the goods is excluded. Furthermore the layer of nickel does not peel off, as frequently happens when the articles have been plated.

The following process is used for making such compound metals.

In the first place the packages of metal to be rolled are made up in the following manner. Rolled steel sheets, 9 inches wide by 12 inches long and ¾ inch thick, after having been pickled and cleaned, are laid on top of each other and a thin nickel sheet of the same dimensions is laid on the top or on the top and bottom. A thin soft sheet of steel is then wound around these sheets, so that the whole is made up in the form of a package. The thin sheet of steel has the purpose of holding the other sheets together and it also protects the sheet of nickel during the heating from oxidation and from damage during the hot rolling. When the sheets are pickled afterwards, the thin sheet of steel is dissolved by the acids and the pure nickel appears undamaged. The gauge of the nickel sheet varies according to the thickness of the layer desired, such as 2 per cent, 5 per cent, 10 per cent or 20 per cent, etc., on one or both sides. After the package of metals has been made as described, it is brought into a heating furnace, where it is heated up to a strong red heat. This operation takes about 20 minutes, when the right degree of heat is obtained in the furnace.

It is then brought to the first rolling train in which it is rolled quickly four times in a transverse direction and six times in the long direction. The still hot sheets are then heated up again in a heating furnace, after which they pass again about 10 times in a longitudinal direction through a second roll, called the hot roll. The sheets are now about 60 inches long and about 20 inches thick and are left to cool. The first roll has to be heavy and must turn slowly, while the second roll is lighter and has to turn quicker. After the sheets have cooled off, they are pickled in dilute sulphuric acid, dried, the corners trimmed by means of large shears and the sheet is cut into two parts. The sheets are then cold rolled between three rolls arranged above each other, of which rolls the middle one only is coupled to the engine. Two sheets are always rolled at the same time, one sheet above and one below the thin middle roll. The rolls have to be kept scrupulously clean and polished all the time. The polishing of the rolls is done in wooden blocks covered with soft sheet copper, a mixture of oil, petroleum and emery being used.

As the sheets have been rolled out, they have become hard, and consequently they have to be annealed with exclusion of the air. They are therefore brought into a cast iron box, the lid of which is made tight with clay. Box and contents are then brought into the annealing furnace and are slowly and evenly heated and cooled off slowly. The annealed sheets are then straightened out in a machine. After that the sheets are again pickled for a short time and are then polished with pumice stone or sand in conjunction with water by means of large brush rolls. It is of course more economical to use polishing machines, which may be had already in the American market.

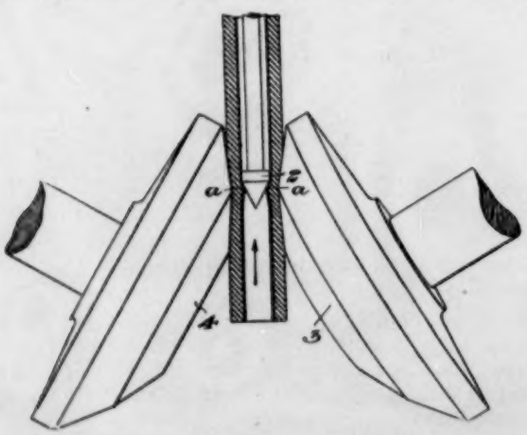
The polished and bright sheets which have now a dull white appearance of nickel are brought again to the shears and are either cut in strips or oval or round discs, according to requirements. Cooking utensils and other articles are stamped from or pressed in them and are then polished. For finished sheets it is necessary to repeat the rolling, annealing, pickling and polishing until the desired gauge has been produced. The longer and thinner the sheets are rolled, the purer and more beautiful is the nickel surface, that is, if the rolls are always kept in good order. If the sheets have to show a high polish, they have to be polished by automatic polishing machines, which machines can also be obtained in the American market. It would not pay if these large sheets were polished with small buffs on flexible shafts, as it is mostly done to-day, and which is the reason why the sheets polished in this country are so expensive. An automatic sheet-polishing machine polishes a sheet 40 x 80 inches in two minutes. The same can be said of the automatic scouring or cleaning machines.

The scraps from the compound metals are utilized again by placing them in dilute sulphuric acid, which does not attack the nickel but dissolves the iron or steel and forms sulphate of iron. The latter is evaporated down and sold to chemical works or dealers. The nickel is again melted together with fresh sheets. Scraps of nickel and copper alloys of compound metal are cut also into thin strips and are heated in an annealing furnace, after which the red hot strips are dumped into water, by which means that the alloy peels off from the iron or steel. The strips are then brought for a short time into a large tumbling barrel, so as to remove the still adhering parts of nickel. The strips are then tied together in packages and stamped down and sold to the iron works. The metallic alloy in the form of thin scales is melted again. A rolling mill which intends to make compound metal would make at the same time pure nickel sheets and the alloys of nickel not only for its own consumption for compound sheet, but also for the market, inasmuch as the consumption of pure nickel and nickel alloys, German silver, etc., and nickel anodes is quite considerable.

These metals are worked in the same manner as I have described for compound metal. Pure nickel is directly taken out of the iron mold after casting and is rolled while still red hot. The end of the casting is then cut off, the surface is milled and the sheet rolled, pickled and scoured as noted above. German silver is only rolled cold, but must otherwise be treated in the same manner as nickel sheets if a good quality is to be obtained. Compound metal wire is obtained in the same manner as compound nickel sheets, namely by making a package of iron rods surrounded by nickel sheet and heating, rolling and afterwards drawing to the required gauge. Very fine compound sheets for the manufacture of coffee and tea sets, reflectors, etc., are passed, after they have been polished again, through a pair of rolls with highly polished rolls and are then again polished with the automatic polishing machine. As mentioned above the sheets are covered either on one side or on both and many sheets are covered on both sides, one side of which is left mat and the other polished.

COMPOUND PIPE OR TUBE.

An invention which relates to the manufacture of compound tubing having an inside or outside covering of nickel or any other material, has recently been patented by U. S. Patent Nos. 798,055 and 798,056, August 22, 1905, by John H. Nicholson, Pittsburgh, Pa. It provides for forming these compound pipes so that the joints are so securely welded that the pipes do not part. The inventor states that he has discovered that he can successfully weld a layer of nickel to an iron or steel tube, either externally or internally, by applying a seamless tube of nickel to it and protecting the welding surfaces from oxidizing influences, while the nested blank is being heated and pressure applied. A substantial and perfect weld is stated to be obtained in this manner. In carrying

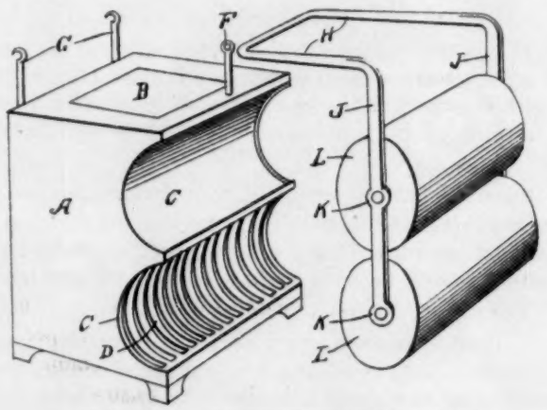


METHOD OF MANUFACTURING COMPOUND TUBING.

out the invention Mr. Nicholson takes a pierced steel billet which has had its interior surface pickled or cleaned and nests within a thin seamless nickel tube of the same length as the pierced billet. Tapering plugs are then driven into the ends of the nickel tube. The compound hollow billet is heated to about 2,300° F and then passed through angularly rotating rolls or disks and over an interior supporting mandrel as shown in the adjoining figure. All portions of the billet are thereby subject to great pressure, thus reducing the thickness of the wall, and the billet is elongated, while a very effective welding operation is also performed. The welded blank is then placed on a mandrel and at the same heat is reduced in diameter and thickness and elongated by the well known swaging process used in making seamless steel tubes.

APPARATUS FOR HEATING METAL ROLLS.

A novel construction for a heater to be used in combination with a pair of metal rolls for rolling sheets of tin or other thin metal has lately been patented by U. S. Patent No. 799,310, of September 12, 1905, by B. H. Doll, of Cumberland, Md. As shown in perspective view in the adjoining cut, the heating arrangement consists of a casing A which is provided at the top with an opening fitted with a cover B for supplying fuel. Its side walls are cut out or recessed at C in order to receive the pair of rolls and the lower portion of the heater is provided



APPARATUS FOR HEATING METAL ROLLS.

with a barred or grated section D, the lower wall of which is provided with grate bars. A handle F and pair of hooks G at the front and rear wall respectively of the heater serve for holding the suspending frame H, which carries the pair of metal rolls L. In operation fire is made in the grate portion of the heater and the stove is fitted to the rolls, so that the heat comes directly in contact with them and heats them to any degree desired. When it is desired to heat the rolls for use in rolling sheets of metals, the device is attached to the rolls until they are sufficiently heated and the heater is then removed.

LARGE SOLID SILVER DINNER SET.

What is probably the largest and most valuable set of silver and cutlery ever made in Sheffield has just been completed by Harrison Bros. & Howson, of that city. It consists of a dinner and tea service in solid silver which is to be a gift from the Premier Diamond-mining Co. to Mr. T. M. Cullinan, its founder, as a memento of the recent finding of a diamond of abnormal size. The numerous articles are enclosed in two huge cabinets of solid oak, each 7 feet high, and fitted with drawers and shelves lined with silk velvet. The goods have absorbed no less than 3,307 oz. of silver, and represent a value approaching £1,500. Every article of hollowware is of solid silver, elaborately chased, and the forks, fruit and fish knives and spoons are all of the same metal. The hafting is carried out in ivory or pearl, and the teapot, kettle, and coffee-pot are fitted with carved ivory handles. The design of the tea service is Georgian, and the trays and dishes have Georgian mounts. The items comprise six dozen ivory table and dessert knives and four carver-sets, six dozen silver forks, the same number of pearl-handled fish and fruit eaters and fish-carvers, a complete tea-set, three trays, three bowls, four vases, six *entree*-dishes, six jugs and decanters, fish-dish, two asparagus dishes, soup-tureen, fourteen fruit-dishes, venison-dish, revolving-dish, eighteen dozen spoons, ladles, and odd articles.—*The Ironmonger.*

ELECTRO-CHEMICAL CLEANING BATHS AND THEIR USES.

By Charles H. Proctor.

In many plating establishments there are in use what are known among the plating fraternity as electro-chemical baths. They serve for the production of an absolutely clean surface on polished iron or steel before such articles are immersed in the plating bath. Platers who have used such solutions claim to have obtained excellent results and to have gotten the deposit more adherent than those produced in any other methol of cleaning. This is especially true of such articles as surgical instruments, polished steel shears, skates, steel knives and forks which are to be silver plated, typewriter parts and such other lines of goods where an absolutely adherent deposit of metal is desired.

In carrying out the method the baths are arranged exactly as plating solutions, but of course, they contain no metallic salts in solution. As cathodes there are used sheet or wrought iron. The only result looked for in the operation is the copious evolution of hydrogen, which is set free at the surface of the articles to be cleaned. This hydrogen destroys any particle of organic substances and also reduces the oxides, thus leaving the surface of the articles entirely clean. The tanks in which the operation is carried out, should be preferably of wrought iron, but wooden tanks may also be used, which are provided with facilities for warming the solution. The latter is heated up, because with a slightly elevated temperature better results are obtained. In using these solutions the polarity of the bath is, of course, reversed and the articles are connected just in the opposite way as they would be in an ordinary plating solution. Thus when metallic iron tanks are used, the tank itself can be made the cathode and the articles can be connected as anodes. If wooden tanks are used the cathodes must be of boiler plate iron, of any dimensions, as exact dimensions are not absolutely necessary.

The bath should of course be constructed according to the dimensions of the articles to be cleaned, but at least 6 or 8 inches of clearage should be allowed between the anode and the cathode and the bottom of the tank. The current strength need not be excessively great, but a little more volume can be used than in nickel plating for the same amount of surface. A current, which might be used, might be 20 amperes at 46 volts per square foot of surface, but an increase or decrease does not matter materially.

In the preparation of the work for the electro-chemical cleaning bath it is necessary that the work be cleaned sufficiently so as to avoid all superfluous grease, oils or heavy oxides. Cleaning with pumice stone, however, or with other scouring compounds, can be entirely dispensed with. It should, however, be the aim of the plater to keep these cleaning solutions as clean as possible and to use them entirely for the final cleaning, before the articles are immersed in the plating solution. A minute or so of immersion in the cleaning solutions will be sufficient. After this operation the articles are washed and immersed directly in the plating solutions.

Articles of brass, copper or the soft metal alloys cannot be cleaned in this manner, as the solution would act on the polished surface of the non-ferrous metals and destroy their lustre. As a rule articles of brass and copper are cleaned easily enough in comparison with polished iron or steel. The following bath is recommended for small articles of steel and should be composed as follows:

Potassium carbonate, 2 oz.; potassium cyanide, C. P., 2 oz.; sodium carbonate, 1 oz.; common salt, ½ oz.; water, 1 gal.

Another solution for iron and steel is composed of:

Caustic potash, 2 oz.; sodium carbonate, 1 oz.; potassium cyanide, 1 oz.; water, 1 gal.

For cleaning work that is somewhat greasy, the density of the solutions may be increased according to the ratio given in the formula. The operator may be able to judge of this matter himself, by accustoming himself to the work of the bath. The idea of using this cleansing bath probably originated with the silver plater of steel knives and forks, who as a last precaution in cleaning immersed his work in a 10 per cent solution of potassium cyanide, using an anode of copper with a very small amount of silver, probably one-twentieth of the dimension of the copper surface. The articles were then afterwards placed directly in the striking solutions. In plating establishments where this class of work is produced, this method still maintains its place.

THE DEPOSITION OF METAL ON NON-METALLIC BODIES.

A new process for the deposition of silver on a wax or other metallic mold, for the purpose of making the latter conductive, has recently been described by C. F. Blacklidge, of Washington, D. C., in U. S. patent No. 197,218, of September 12, 1905. The wax or other mold is treated previous to the application of the silver with an alcoholic solution of collodion, made up by dissolving about one grain of gun cotton (pyroxylene) in about ¼ oz. of sulphuric ether and ¾ oz. of 15 per cent. alcohol. This solution is flowed over the mold or is applied with a brush, and after the application the mold is permitted to dry. A silver solution is prepared by adding nitrate of silver to water in about the proportions of twenty grains of the former to one ounce of the latter and adding liquid ammonia until the precipitate is redissolved. The reducing agent consists of 40 per cent. formaldehyde, diluted with water in about the proportion of one ounce of the former to three ounces of the latter.

The reducing agent is added to the silver solution in about the proportion of six drams of the former to two ounces of the latter and the mixture is then immediately applied to the mold. This is done preferably by pouring the mixture on the face of the mold and manipulating the latter so that the liquid flows evenly over it. The mold is thus treated until the metallic silver appears upon it, which takes place in from two to five minutes, when the mold will show a compact and uniform surface of metallic silver. The process is designed more especially for depositing nickel, in order to prevent the nickel from peeling off during the use of the electrotype by providing the mold with a compact metallic surface before the nickel is plated on.

DARK STEEL OXIDIZING.

By Chas. H. Proctor.

A simple solution which gives very good results on copper and brass and which produces a dark steel color useful for obtaining oxidized and shaded effects is composed as follows:

8 oz. Commercial Muriatic Acid.
½ oz. Yellow Sulphide of Arsenic.
1 gal. of hot water.

A temperature of about 180 degrees should be maintained during the mixing. A little very hot water should be added to the acid first and then the arsenic. This solution works very rapidly and the work must be absolutely clean.

OXIDIZING SOLUTIONS AND THEIR USES.

By Herbert J. Hawkins.

There is a continuous struggle and striving after new finishes suitable for metal goods requiring an artificial finish. Something new and original, at the same time lasting in wearing qualities and pleasing to the artistic eye, is what the trade demands. The purpose of oxidizing is usually to remove the glare and luster from the bright and plain metal finishes. Usually the object is to imitate the finish upon old objects that have become oxidized from exposure to the atmosphere and by age. But after all, notwithstanding the efforts of artisans for something new and substantial, we have very little left in the way of a really useful oxidize, when the few old standbys are removed that have been in everyday use for more than a quarter of a century. New finishes come because they are new and pleasing; they go because they will not stand the wear and tear required of them, and in a few months either wear off or fade out, leaving an unsightly object.

Liver of Sulphur is perhaps one of the oldest, if not the oldest, at the same time one of the most useful oxidizing agents. It has the merit of giving a decided color, or many different colors, I should say, and has exceptional wearing qualities; a quality lacking in so many finishes. The Liver of Sulphur dip is used over a wider class of metal goods than any other finish. It is used upon silver jewelry and novelties; sterling silver of all classes for producing old silver, French Gray and other antique effects. Then on the line of hardware and art goods, both in iron, brass and copper, there seems to be no end to the use of this very old, yet valuable, oxidizing agent, while the finishes that may be obtained from it by the skilled mechanic are many and beautiful.

The Iron and Arsenic solution is a very valuable oxidizing agent, has been used many years and is having a wider field of usefulness and is constantly increasing in favor as a finish; more particularly is this so in the hardware trade, and upon all classes of brass goods requiring an antique finish.

For a brown black, the following is generally used:

Muriatic acid	5 gal.
Arsenious acid	5 lbs.
Carbonate of Iron	10 oz.

For a blue black sulphate of iron is used in place of the carbonate; increased quantities of the iron or arsenic may be used. This dip works best if kept free from water and will work with or without the current as desired. It also works well and gives some pleasing finishes when used in combination with the Liver of Sulphur dip upon hardware, or similar goods requiring an antique brass finish, the work being dipped alternately from one to the other. The brass plated work will take on the oxidize more quickly in this way and the finish will be durable and easily to relieve or finish down.

The platinum finish is very popular as an antique finish, or used as the basis of the French Gray finish the results are very pleasing. But the high cost of the platinum makes it too expensive to use upon any but the high grade goods. An imitation can be made, however, that gives almost the same color and finish at half the cost. This is made by adding to the platinum solution a solution made by dissolving sulphate of iron in muriatic acid and adding an equal amount of this solution to the platinum solution. No heat should be used in drying this, as heat brings out a reddish brown tone, due to the iron.

The black nickel is an oxidizing agent that should be mentioned in passing, while strictly it is an electro deposit, yet it is when on the finished article considered as an oxidize. The trouble with this solution is that a great many of the formulæ are complicated and have many ingredients in them, some of which are useless, except to cause trouble and annoyance.

Some platers are getting good results using a simple solution of sulphate of copper and sulphate of nickel, with a nickel anode. There are many new ideas in finishes and oxidizes, but most of them are found wanting and fall by the wayside. To be successful the finish must be pleasing to the eye and have durability and wearing qualities; without these essentials, it will soon pass and be forgotten, while the trade goes back once more to the finishes that are old and tried.

There seem to be great possibilities in the field of finishes for metal goods; that is, for new finishes of real merit. But for the most part, we are still using the same finishes our grandfathers used, dressed perhaps in a little different shade. But for all that, they are the same as of old.

THE ELECTROPLATING OF ALUMINUM.

By A. G. Giroux.

As far as plating of aluminum is concerned, it is, of course, a very well known fact that aluminum is a very capricious metal in many a way. However, as regards the plating of it, there is no mystery. Of course, in order to plate the metal successfully, the operator, no matter how good he is, will have to practice before he is able to master the operation. Let me say that in plating no copper solution (alkali), made to be used with a strong current, is of any use. The operator needs a good conducting solution which will run with a slow current, and a solution that contains cyanide only will not do. It must contain good conducting salts such as carbonate and bisulphite of soda. This is a very important matter in the plating of difficult metals such as aluminum.

A solution which I would highly recommend is composed as follows:

Distilled Water	10 quarts.
Crystallized Carbonate of Soda	8½ oz.
Crystallized Bisulphite of Soda	7 oz.
Neutral Acetate of Copper	8½ oz.
Cyanide of Potassium 98°	8½ oz.

The sodium salts should be used in a crystallized form and the operator should be sure that the acetate is neutral. The solution is made up as follows: In 7 quarts of hot water dissolve the carbonate of soda, and add the bisulphite of soda a little at a time. Crush the acetate of copper and add it in small proportions with vigorous stirring. The cyanide of potash is dissolved in 3 quarts of water and, when the first solution is cold, it is mixed with it. The mixture is well stirred, boiled and filtered. This bath will plate heavily and only a small current of 0.4 amperes, with a tension of 3 volts for a surface of about 15 square inches is required.

A very important consideration is the preparation of the object before it goes to the bath. The operator should get ready to get all his work, which is to be cleaned, through in a hurry, in the same manner as is done with steel. The work must not lay about, because aluminum is just as easy to oxidize as steel, although it may appear very white. In a moment it will take a grayish tint, which surely will prevent a successful plating. The article to be plated is left some time in a solution of cyanide of potassium of 8 oz. to the gallon of

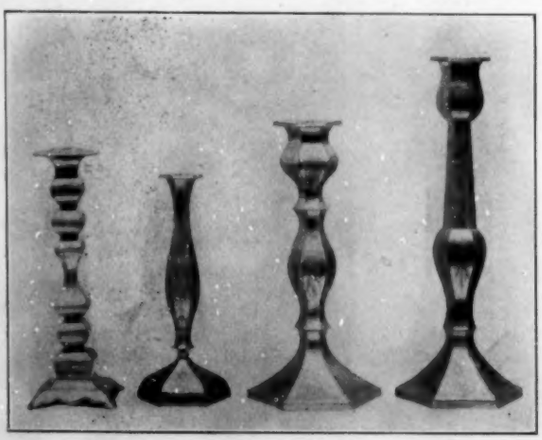
water. It is then brushed with pumice thoroughly in and out. When it is perfectly clean, it is dipped into hot potash until gas bubbles are evolved. It is then rinsed in cold running water and then in a solution of corrosive sublimate, made up of water, corrosive sublimate and cyanide of potassium. After this it is dipped directly into hot potash, just long enough to see the bubbles appear. It is then dipped in water again and once more into corrosive sublimate and then directly into the plating bath.

One of the most important parts of the operation is to fix the current in a proper proportion to the size of the work. There must not be a single bubble seen through the solution, as otherwise the object is sure to fail. If the operator has much work to do it would be absolutely necessary to provide himself with an indicator such as an ampere and voltmeter and this would easily put him in the right way. As I said before, if the operator works by the rule of thumb he will certainly have to practice, because the plating of aluminum is a hard operation for a beginner. I have worked it with success and I am sure that if the operator sticks to it he will certainly find a good solution.

A quick worker is necessary because there is a certain danger of destroying the finish of the metal. It is, therefore, necessary to watch the potash dip, as too long a dipping would cause the object to appear heavily frosted. In general, as I said above, when a piece is started once it is better to complete it right away. In one word success is due to the perfect cleanliness of the object. I would recommend the operator not to potash first as in ordinary plating, but to clean the work exactly as I described above and watch the current, so that it will be just strong enough to plate easily, and to avoid to plate with evolution of gas.

ANTIQUE DESIGNS IN CANDLESTICKS.

The accompanying cut shows some designs of brass and copper candlesticks manufactured by J. Weintraub & Son, 177 Grand street, New York. The designs are reproductions from genuine Russian antiques, which the



ANTIQUE CANDLESTICKS.

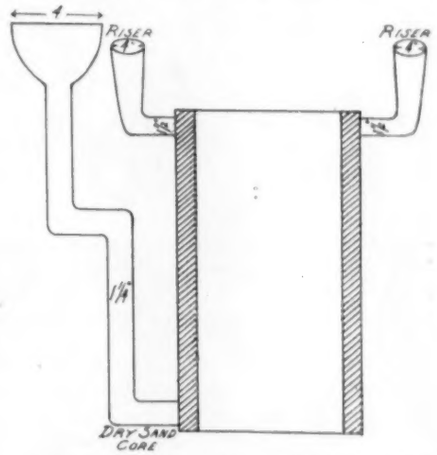
firm make a specialty of importing and reproducing. The firm have a large trade from stores who sell antiques and brass and copper art metal goods. Besides candlesticks the firm makes candelabras, jardiniers, trays, pitchers, wall brackets, etc.

Electroplating dynamos should be protected from the workshop fumes as much as possible and should also be so located that metallic dust, etc., cannot deposit upon them.

CASTING BRASS LININGS.

The method of casting brass linings so that the castings turned out may not be porous is a thing which sometimes bothers manufacturers. In an inquiry received by THE METAL INDUSTRY one of the inquirers states that he is making brass linings which run in sizes from 8 inches in diameter to 28 inches and are from 15 to 30 inches in length and from ¼ to 1 inch in thickness. They are finished inside and outside. They turn up porous, and Schwartz furnaces and crucibles were tried with the same result. The mixture was 87 lbs. copper, 8 lbs. tin and 5 lbs. spelter; it was changed to 88 lbs. copper, 10 lbs. tin and 2 lbs. spelter, with the same result. The castings were gated from the bottom and they were also gated from the top, but they still remained porous.

In a matter of this kind the gating should be carried



SKETCH SHOWING METHOD OF GATING AND RISERS.

out as shown in the accompanying sketch, and a mixture might be used of 87 per cent. copper, 5 per cent. zinc, 5 per cent. tin and 3 per cent. of lead, with an addition of 3 oz. of silicon copper. The latter is to be added when the metal is taken from the furnace. The metal should be poured at a good heat and not too cold, as dull, pasty metal absorbs gases. Silicon copper will help this, but it is best to pour at a good heat, and when the mold is poured the riser should be fed up with hot metal. If it is still desired to use the mixture of 88-10-2, the pouring must be done at a good heat in order to avoid separation, which will take place as the metal cools and which causes hard spots and very often spongy castings.

If the metal is made in the Schwartz furnace it is suggested that the mixture be melted down in a crucible and poured into ingots. When the copper is good and hot the mixture should be added. The blowing should not be more than ten minutes after the mixture is added, and 3 oz. of silicon should be added to every 100 pounds of metal when the metal is ready to pour. If these conditions are followed success is sure to come, inasmuch as they are the ones that are used by an experienced brass founder, who makes a great many castings of a similar type.

THE METAL INDUSTRY is the first journal in the world to be published in the interest of the non-ferrous metals. Devoted to all of the non-ferrous metals and alloys since January, 1903; to the aluminum, brass and copper industries since October, 1894.

The value of the gold production in this country in 1904 was $80,723,200, while the value of the silver produced amounted to $33,515,938.

TESTS OF THE ROCKWELL MELTING FURNACE.*

By W. S. Quigley.

A test made in the laboratory of the American and British Manufacturing Company, with a Riehle testing machine for Eaton, Cole & Burnham, Bridgeport, Conn., to determine if the direct heat upon the metal had any injurious effect, resulted as follows:

OIL FURNACE.

	Tensile Strength.	Elastic Limit.
Charge No. 1	27,400	12,640
Charge No. 1A	28,650	13,620
	56,050	26,260

CRUCIBLE FURNACE.

Charge No. 2	27,420	12,800
Charge No. 2A	25,300	13,040
	52,720	25,840

The above shows an average of 1,665 lbs. tensile strength and 210 lbs. elastic limit in favor of the oil furnace.

After the specimens had been fractured the gripping ends of the speciments were bored to 1" inside diameter and turned to 1.02" outside diameter with ends left suitable dimensions to be threaded to fit standard 1" pipe fittings and subjected to an internal water pressure of 1,600 lbs. per square inch without showing any signs of rupture or any increase of diameter of the specimens.

By actual comparative tests, the loss of metal in the Rockwell furnace was 3.18%; total cost of metal melted per 2,000 lbs., $3.36. In a competing furnace the loss of metal was 3.47%, the total cost of metal melted per 2,000 pounds, $4.36. In crucibles the loss of metal was 3.25%, and the total cost of metal melted per 2,000 lbs., $5.18. This shows a saving of $1.00 per ton over the competing furnace and $1.82 over crucibles. The average consumption of oil per 100 lbs. of metal melted is 1.53 gallons. a comparative cost between the crucible and Rockwell furnace, taking into consideration coal and crucibles on the one hand and oil and furnace linings on the other, is as follows.

Cost of coal per hundred pounds	9.3c.	
No. 70 crucibles per hundred pounds	6.5c.	
		15.8c.
Oil, Rockwell, at 3c	4.59c.	
Linings, Rockwell	1.8c.	
		6.39c.
		9.41c.

9.41 cents per 100 lbs. saving in favor of the Rockwell furnace.

Figured on the total melting cost and the melting cost taking coal and crucibles only in consideration, shows practically the same saving per ton of metal melted being $1.82 in the one instance and $1.88 in the other. The Eaton, Cole & Burnham Co. have installed 8 sets of the furnaces, with a melting capacity of over 25 tons per day.

In another well-known foundry a test was made which showed as follows:

134 lbs. copper, 40 lbs. yellow gates, 100 lbs. yellow turnings, 76 lbs. spelter, 7½ lbs. lead, or 357½ lbs. total metal melted, and 345 lbs. total metal recovered, thus showing a loss of 12½ lbs., or 3.3%. This showing was made on a test heat. An actual day's run of 3,521 lbs. of this mixture showed a loss of 142 lbs., or 4.03%, and on daily runs of over 3,500 lbs. of this metal I understand that the average loss is in the neighborhood of 5% This shows what can be done on yellow brass if the furnace is carefully handled.

In another well-known foundry a comparative test was made, which showed as follows:

	Rockwell Furnace.	Competing Furnace.
Total metal charged	7,000 lbs.	4,500 lbs.
Oil used in melting, including oil required to heat up furnace	93 gals.	94.5 gals.
Oil used per 100 lbs. of melted metal	1.3 gals.	2.1 gals.
Time required to heat up furnace, starting cold	27 mins.	29 mins.
Oil consumed in heating up	8 gals.	6 gals.
Actual time furnace was in blast, including heating up.	7 hr. 58 min.	7 hr. 6 min.
Time per 100 lbs. of metal melted	6.8 min.	9.5 min.
Weight of metal melted per minute of blow	14.6 lbs.	10.5 lbs.
Average time per heat of 500 lbs.	34 min. 750 lbs.	1hr. 11 m.

This shows a saving of 8-10 gallons per 100 lbs. of metal melted, and 5.1 lbs. more of metal per minute.

Shrinkage tests were made on two grades of metal known here as common and government metal.

Common Metal.	Rockwell Furnace.	Competing Furnace.
Total metal charged	500 lbs.	1,600 lbs.
Total metal recovered	488 "	1,557 "
Loss	12 "	43 "
Percentage of loss	2.4%	2.7%
Government Metal.		
Total metal charged	1,000 lbs.	1,300 lbs.
Total metal recovered	987.5 lbs.	1,278 "
Loss	12.5 "	22 "
Percentage of loss	1.25%	1.7%

This test shows an average loss of 1.83% in the Rockwell furnace and 2.2% in the competing furnace. It shows that the Rockwell melts 50% more metal, fuel for fuel. In the above tests the Rockwell furnace melted 14 heats in 7 hours 58 minutes, showing how easy it is to get out different heats of various mixtures.

*Abstract of paper read before the Pittsburg Foundrymen's Association, September 11, 1905.

A NEW METAL MELTING FURNACE.

A new idea or what the manufacturers call a revolution in the melting of brass, bronze, copper, aluminum, is the American Stoker Melting Furnace which is being put on the market by the J. D. Smith Foundry Supply Company, of Cleveland, Ohio. The furnace has an American underfed stoker which permits the burning of bituminous coal with a smokeless flame. The crucibles do not come in contact with the fire itself but are set down in the combustion chamber of the furnace. By this means it is said the life of the crucible is greatly prolonged and that the fuel cost of this soft coal furnace is very much less than coke or oil and that the labor cost is also less. The manufacturers report that an American Stoker Metal Melting Furnace has been in successful operation in the city of Cleveland for over a year and that all of the company's claims for the new melting furnace are based on the practical operation of the furnace during this period and not on theories. Further information about the new furnace may be obtained from the manufacturers.

TESTS OF THE STEELE-HARVEY CRUCIBLE MELTING FURNACE.*

By W. T. Krause.

At the brass foundry of the Maryland Steel Company, Sparrow's Point, Maryland, over which I have supervision in connection with the general foremanship of the iron foundry, a series of tests were made of the Steele-Harvey crucible melting furnace, with the following results:

1,488 lbs. metal; time consumed for melting same five hours and fifty minutes. First heat, 750 lbs., placed in crucible, 7:30 A. M. Metal drawn from furnace 10:00 A. M. Second heat, 738 lbs., drawn from furnace 12:50 A. M. Loss in melting, 1.06 per cent. Amount of fuel consumed, 32 gallons; cost of same, 80c.

SECOND DAY'S RUN.

Metal charged in four heats, 2,252 lbs. Furnace charged 6 A. M. first heat drawn from furnace 8:55 A. M. Second heat charged 9:10 A. M., drawn from furnace 11:55 A. M. Third heat, furnace charged 12:20 P. M., drawn from furnace, 2:50 P. M. Fourth heat, furnace charged 3:25 P. M.; metal drawn from furnace 5:45 P. M. Loss in melting, 1.19 per cent. Consumption of fuel, 56 gallons; cost of same, $1.40.

THIRD DAY'S HEAT.

2,579½ lbs. of metal charged, four heats; time consumed in melting same 11 hours and 55 minutes; loss in melting, .096 per cent. Consumption of fuel, 65 gallons; cost of same, $1.62.

FOURTH DAY'S HEAT.

2.534 lbs. of metal melted, four heats; time consumed in melting same, 11 hours and 10 minutes; loss in melting, 1.03 per cent. Consumption of fuel, 62 gallons; cost of same, $1.55.

Oil in tank was measured before and after each heat.

In comparison with the above the following data illustrate four heats melted in the coke furnace a month previous to the installation of the oil furnace.

1,465½ lbs. metal melted; loss in melting, 2.7 per cent.; cost of fuel, $1.98. 975 lbs. metal melted; loss in melting, 2.8 per cent.; cost of fuel, $1.24. 1,547 lbs. of metal melted; loss in melting, 2.8 per cent.; cost of fuel, $1.89. 534 lbs. of metal melted; loss in melting, 2.9 per cent.; cost of fuel, $1.29. Average loss in melting in oil furnace for four days' run show 1.06 per cent. against 2.8 per cent for coke furnace.

SYNOPSIS OF TEST IN OIL FURNACE (1-275).

1,488 lbs.; 32 gal. oil, cost 80c.; loss, 0106. 2252 lbs.; 56 gal. oil, cost $1.40; loss, .0119. 2.579½ lbs.; 65 gal. oil, cost $1.62; loss, .0096; 2,534 lbs.; 62 gal. oil, cost $1.55; loss, 0103. 8,853½ lbs.; 215 gal. oil, cost $5.37; average loss, .0106.

Crucible in 14 heats, pro-rata cost, $6.50; $11.87.

Average cost of 100 lbs., including oil and crucible, .134.

SYNOPSIS OF COKE FURNACES.

1,465½ lb.; cost of coke, $1.98; loss, .027. 975 lb.; cost of coke, $1.24; loss, .028. 1,547 lb.; cost of coke, $1.89; loss, .028. 534 lbs., cost of coke, $1.29; loss, .029. 4,521½ lbs.; cost of coke, $6.40; average loss, .028.

Cost of crucible No. 275 average life 9 heats, $8.67; $15.07.

100 lbs. metal, average cost, including coke and crucible, 33 1-3c.

At the request of one of the superintendents the author made the following test to ascertain the percentage of oxidization:

TEST NO. 1.

Copper	350 lbs.
Tin	30 "
Zinc	10 "
Scrap Brass	150 "
Gates	185 "
	725 "
Metal taken from pot	722 "

TEST NO. 2.

Copper	400 lbs.
Tin	40 "
Zinc	10 "
Scrap Brass	150 "
Gates	150 "
	750 "
Taken from pot	746 "

On account of the above tests the metal taken from pots represented the actual quantity received, showing loss, test No. 1, .41 of 1 %; test No. 2, .41 of 1%. Both tests were made in new crucibles.

The life of crucibles No. 275 has been while in use since December, 1904, an average of 24 heats. On one occasion the works ran short of crucibles and the author placed one in the furnace that had run seven heats in the coke furnace, and was set aside as being too risky to run more heats from. It stood twenty-two heats, making a total of twenty-nine heats.

The furnace ran six months before it was necessary to reline it, and then only the inner course was put in, leaving the outer course of bricks in, which are still in use. This work did not require the aid of a mason but was done by the man that ran the furnaces.

The life of the carborundum brick in the bottom of the furnace, which acts as seat for the crucible will be, with care and proper attention to the slagging of the furnace, about two months.

Stress should be laid on the furnace tender to keep the furnace free of slag by removing the latter when in a liquid state and to always have the crucible set in the center of the furnace firmly upon the carborundum base block, so as to secure a uniform flame and perfect combustion.

The proper fit of tongs in the brass foundry to the crucibles that are to be handled with them, is a subject which should receive proper attention, inasmuch as ill-fitting tongs are responsible for the loss of many a crucible which would otherwise have stood a good many more melts.

Carelessness in packing the metal into the crucible, especially when ingot coper and heavy pieces of brass are melted, frequently leads to the loss of the crucible by breakage.

Tin ore is said to have been discovered near Cape Prince of Wales, in Alaska, the ore containing also sufficient gold to pay for working. The deposit is stated to be 200 miles long by fifty miles broad.

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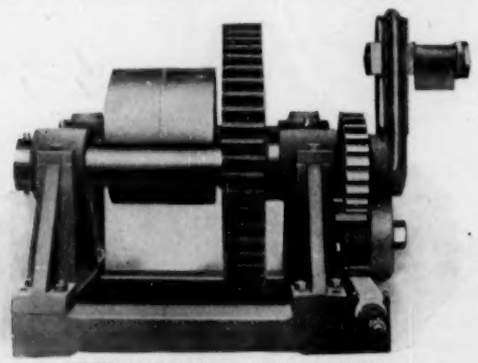
*Abstract of paper read before the Pittsburg Foundrymen's Association, September 11, 1905.

NEW MODEL AUTOMATIC DROP LIFTER.

The new model of The Peck automatic drop lifter is shown in the accompanying cut. The lifter has been on the market for years and is noted for its durability and ease of operating and adjusting. The makers state that the durability is the result of using the crank principle which brings less strain on its parts and also from its being placed on a separate frame which prevents its being jarred to pieces by the action of the hammer. In the new model as quick and snappy a blow is obtained as is given by the friction board lifter, and all the merits of durability have been retained which were possessed by the older models of the Peck Lifter. The crank shaft of the new model has no weight hung on it and is thus free to re-

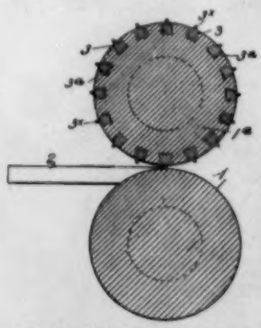


PECK AUTOMATIC DROP LIFTER.

volve easily without being held back at all. Another feature is that this shaft can be removed by taking out the pin in the collar at the back end, slipping the collar off, and pulling the shaft right through without disturbing any of the parts or even removing the driving belt. The model is made in 9 sizes, lifting a hammer weighing from 150 pounds to one of 5,000 pounds and striking 60 or 70 blows per minute. The lifter can readily be applied to any drop press and will save both time and labor and make the work more uniform. It is manufactured by the Peck Drop Press Works, New Haven, Conn., whose presses are in use throughout the United States and Canada by manufacturers of brass goods, flat ware and silver ware.

MACHINE FOR CUTTING SCRAP METAL.

The machine has recently been patented by U. S. Patent No. 797,886, of August 22, 1905, by P. F. Deely, Waterbury, Conn. It is intended to cut all kinds of scrap metal, such as brass, spelter, wire, alloys, etc., regardless of its thickness. As shown in the adjoining illustration

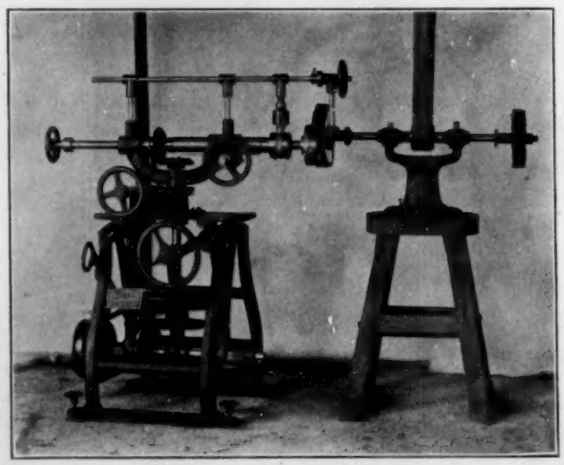


SCRAP METAL MACHINE.

the machine is so constructed that it does not perform its work by cutting the articles, but by exerting a breaking action upon them. It consists of two rolls 1, 1a, which are superposed upon each other and in communication with a feed table 2, upon which the scrap metal is fed to them by hand or otherwise. The lower roll has a plain face, so as to carry the metal. The upper roll, however, is provided with longitudinal sockets or pockets 39, which extend the entire length of the roll and each of which receives two cutter members 3, which break the metal into pieces. Suitable provision is, of course, made for holding these cutting arrangements in place. The construction of the cutting members as seen in the illustration is such as to break the metal in two upon the lower feeding roll and deliver the pieces on the opposite side of the feeding roll.

NEW AUTOMATIC BUFFING MACHINE.

The accompanying cut shows the Sellmayer Automatic Buffing Machine, which, though on the market long enough to test its practicality, is a comparatively new machine. It is automatic in its workings. When the operator has placed a piece of work on the form or holder and started the machine in motion, no further attention is required until the piece is finished. Two of the machines are operated in connection with each buffing lathe. The machine is placed at either side and in front of the buffing lathe at a distance sufficient to allow the end of the shaft on which the form or holder is fixed to come in contact with the buff wheel.



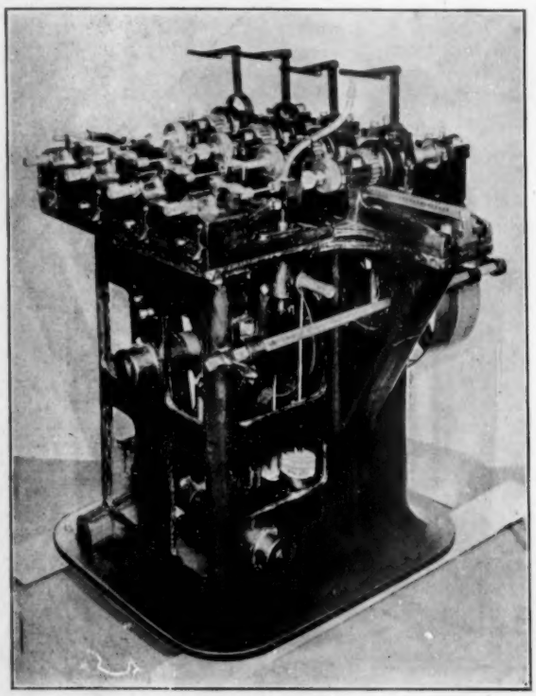
SELLMAYER AUTOMATIC BUFFING MACHINE.

To work the machines to best advantage the buffing lathes should be arranged in lines of four, five or six working from eight to twelve buffing machines, which it is said on many kinds of work can be operated by one man. The machine will buff any round surface and is particularly adapted to pots, kettles, cuspidors, chafing dishes, etc. The C. T. Ham Manufacturing Company and the Rochester Stamping Company, of Rochester, N. Y., have together thirty-two of these machines in operation, and S. Sternau & Co., of Brooklyn, N. Y., are also using them. The machine is also particularly suitable for automobile lamp work. It is made by the Sellmayer Manufacturing Company, of Rochester, N. Y., J. A. Parker, sales agent, with offices at 603 Livingston building, of the same city.

The city of Newark, N. J., has the reputation of manufacturing more different articles than any other, and has many factories devoted to the production of goods in the cast metal, sheet metal and wire line.

NEW MODEL COCK GRINDER.

The accompanying cut shows the new model of the Turner 4-Spindle Automatic Cock-Grinding Machine which is built and sold by the Turner Machine Company, 2049 North Second street, Philadelphia, Pa. The machine is especially designed for grinding high grade gas, air and steam cocks of a size not larger than 5/8 of an inch and the manufacturers say that it will do this work better than can be done by hand and in one quarter of the time. The spindles are operated by cut gears and a bronze cut



NEW MODEL TURNER COCK GRINDER.

rack and make seven-eights of a turn in each direction. Any spindle may be instantly thrown out by means of friction clutches which are operated by levers above the bed-plate. As it is built upon a cabinet base the machine is very compact, requiring a floor space of only 40 x 44 inches. A number of the machines are working in New York and vicinity and are giving good satisfaction. The Turner Machine Company also manufacture cock grinders which will grind gas, air, water and steam cocks from 3/8 of an inch to two inches.

SAND MIXING MACHINE.

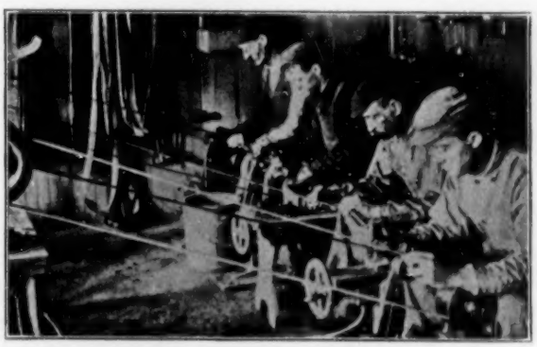
As brass foundries increase in size they find the need of power working machinery. What could be done by hand in the small jobbing shop cannot be accomplished at a profit in the large manufacturing works, and the brass founder has to install many of the appliances which the iron founder has already found necessary. The accompanying cut shows the latest pattern of a centrifugal sand mixing machine, which is manufactured by William Sellers & Co. of Philadelphia, Pa., and which is sold with either a belt or motor drive. The machine consists of a rapidly revolving table having a number of upward projecting prongs. The sand is fed into the hopper at the top of the machine from which it falls upon the revolving table, and is then thrown by centrifugal force out against the inside of the hood. It emerges from beneath the hood in a fine shower free from lumps and thoroughly mixed. The hopper is hinged for the convenience of cleaning the prongs and of removing the

SAND MIXING MACHINE.

stones, nails, etc., which do not pass between them. The machine will mix sand at the rate of about 5 tons per hour, thus making a great saving in labor and time.

A NEW POLISHING BELT.

The accompanying cut shows the use of a new endless polishing belt in the polishing department of a large hardware manufacturing company and which belts and straps were recently put on the market by L. H. Gilmer & Co., of 3952 Market street, Philadelphia, Pa. The belts are made out of standard webbing with a patent splice which gives them a perfectly smooth surface



POLISHING BELTS AT WORK.

throughout the entire length. It is claimed that they will outlast the ordinary webbing many times and will wear half way through before breaking. A sample of the belt sent to THE METAL INDUSTRY office shows a very smooth joint. They are suitable for use wherever there is polishing and are endorsed by a number of the leading manufacturers. They are also sold by the J. D. Smith Foundry Supply Company, of Cleveland, O., and R. B. Ridgeley, of Detroit, Mich.

The growth of the market for German silver is indicated by the fact that one Naugatuck Valley rolling mill is at present turning out 13,000 pounds of sheet per day.

CORRESPONDENCE DEPARTMENT

In this Department we will answer any question relating to the non-ferrous metals and alloys. Address THE METAL INDUSTRY, 61 Beekman St., New York.

Q.—Please inform me how to make an iron solution such as is called a steel solution for use of oxidizing brass. We have one of them in the shop where I am employed but it is running out and I would like to repair it.

A.—To produce a solution such as the one referred to proceed as follows: Mix together 1 lb. white arsenic and a ½ pound of caustic potash or caustic soda in 24 oz. of hot water. Add the substances to the water slowly. Dissolve 8 oz. single sulphate of nickel in one quart of warm water and one gallon muriatic acid and mix the nickel solution with the muriatic acid first and introduce afterwards the arsenic and potash solution. Allow the mixture to cool before using it. Nickel anodes should be used and a small current. This bath produces a bright black deposit on polished goods and a gun metal finish on dull or scratch-brush work. The articles must be quite clean before immersion in order to obtain good results. The present solution might be improved by dissolving as much white arsenic in one gallon of muriatic acid as the acid will take up, heating the acid up as much as possible.

Q.—I would like to know how to mix metal such as is used for making casket handles.

A.—A white metal known as coffin trimming metal consists of lead, 100 lbs.; antimony, 15 lbs.; tin, 1 lb. When melting the metals a raw potato should be used as a cleanser. This brings the dross to the surface and makes the metal work more clear and fluid.

Q.—Would you kindly inform us of any process whereby silver can be oxidized green?

A.—A solution consisting of 2 oz. commercial sulphate of copper dissolved in one gallon of hot water will produce a green oxidized effect upon silver. The articles should be scratch-brushed to a dead lustre with the aid of a brass wire machine scratch brush, moistened with flour pumice stone and water. From ½ to 1 minute immersion will give results. The articles show the green more distinct when lacquered.

Q.—Will you give me a receipt for steel plating, the solution to be made without acid or arsenic?

A.—A solution for steel or rather iron plating should consist of: Sulphate of iron, 5½ oz.; ammonium chloride, 13½ oz.; ammonium citrate, 3½ oz.; water, 1 gallon. Anodes of wrought iron should be employed. The double sulphate of iron and ammonia may also be used and 6 to 8 oz. of this salt should be employed to each gallon of water.

Q.—I am sending you a sample of brass tube in shaded or mottled brass color. You will find on the oxidized parts small specks which have appeared since the goods were wrapped up a few months ago. We occasionally find the same trouble on oxidized copper and are unable to account for it. The moment the lacquer is removed—boiled off—the specks disappear without blemishing the finish, and when re-lacquered the work looks all right. The oxidizing solution is composed about as follows: 12 gals. of water, 1½ quarts muriatic acid, teaspoon white arsenic, small piece of German liver of sulphur. It is used hot. Kindly give me an explanation of the above occurrence and a remedy.

A.—The stains noticed upon the sample tube sent for inspection are evidently due to minute pin holes in the metal. These holes expanding under the influence of the heat of the coloring solution absorb some of the chloride formed, and as they contract during the washing, they retain some of the salt in the pores of the metal. This gradually works up to the surface of the metal and produces the stains beneath the lacquer. The latter are probably due to the chloride of copper and zinc formed by the dilute acid. These stains are probably more noticeable when the articles are finished when the atmosphere is moist, as it is in the summer months. With excessive dampness the deposit will entirely disappear, leaving the lacquer intact. The only preventative in a matter of this kind would be the exercise of greater care in washing the deposit. Boiling water should be used, to which 1 or 2 oz. of whale oil or fish soap is added for each gallon of water used. This solution is of a slightly alkaline nature; it does not act on the color and will help to neutralize the acid in the pores of the metal and should prevent this spotting out. When wrapping the articles, absolutely dry tissue paper should be used, and when they are stored away for any length of time they should be placed in as dry a place as possible.

Q.—We beg to inform you that the mixture which you gave for scrap gives very good brass castings. We have, however, decided to sell our sheet brass scrap, and would now thank you very much to give us a proper mixture, using brass rod scrap only.

A.—A formula for using brass rod scrap only might be made up as follows: Copper scrap, 38 lbs.; brass rod scrap, 54 lbs.; zinc, 6 lbs.; tin, 1 lb.; lead, ½ lb.; phosphor tin, ½ lb. In melting proceed according to directions furnished in the formula published in the August issue, 1905, of THE METAL INDUSTRY.

Q.—In regard to French lacquer, I should like to find out what kind of resinous gums are to be used and how much of them.

A.—French lacquer as applied to brass bedsteads is a misnomer as far as the lacquer itself is concerned. It sounds well for advertising purposes. The English were the originators of the brass bedstead and they probably imported the varnish from France and gave it the gold color themselves and hence the name of "French lacquer" which remains to-day. Nearly all of the French varnish produced for use in the United States to-day is manufactured by a well-known New York concern. The French varnish may be made by dissolving 2 lbs. gum sandarac in 1 gallon of grain or wood alcohol by agitation. The mixture is allowed to settle and the clear varnish is poured off the sediment. One-half ounce of chemically pure glycerine is then added to the solution.

Q.—Can you furnish the formula for making a green finish or verde antique? It is for sale, is thin like water and of greenish shade. When brushed on or when the goods are dipped in it and the solution is allowed to dry, the articles become covered with an adherent coating of green.

A.—We do not know the composition of the verde antique solution referred to. A solution composed as follows will produce a verde green on copper or brass by immersion or brushing, allowing it to dry, and lacquering the articles with a colorless lacquer. Better results are obtained if the articles are slightly oxidized with sulphuret of potassium. The solution should be used warm and should be made up as follows: Copper nitrate, 5 oz.; ammonium chloride, 5 oz.; calcium chloride, 5 oz.; water, 1 gallon.

Q.—We should like to have a formula for a green finish on brass and copper as used on lamp shades and to know something about the preparation of the metal to take the finish.

CORRESPONDENCE DEPARTMENT

In this Department we will answer any question relating to the non-ferrous metals and alloys. Address THE METAL INDUSTRY, 61 Beekman St., New York.

A.—The green finish is known as verde antique and is made by applying acids salts of copper and by immersing the articles in a warm solution of acid mixture. The articles are afterwards dried in a warm place for 24 hours and lacquered with a colorless lacquer. The preparation of the work is more or less simple. It is necessary to have it clean and free from greasy matter. The oxides of the surface can remain as they help the process. For the finish on brass and copper it is necessary to produce a dead surface similar to old brass finish with pumice stone and a tampico brush. A brush suitable for hand work or a machine brush might be used on a scratch brush lathe. After the work is prepared the articles should be carefully dried. A paste should then be applied with a soft brush, which paste should have the following composition: 50 oz. acetic acid (weak), 15 oz. sal ammoniac, 5 oz. common salt, 5 oz. cream of tartar, 5 oz. acetate of copper, 10 oz. water. The solution should be mixed well and applied with a soft brush and should afterwards be left to dry for at least 24 hours. Another solution which may be used for immersing the articles should be made up as follows: Copper nitrate, 5 oz.; sal ammoniac, 5 oz.; calcium chloride, 5 oz.; water, 1 gallon. The solution should be used warm and the articles should be dried as before. Quicker results may be obtained if the articles are slightly oxidized in a slightly warm solution of potassium sulphide, containing ¼ oz. of this salt to each gallon of water. The articles should be washed well in cold water, passed through boiling water and immersed in the coloring solution. Some very beautiful verde antique effects may be produced by using pigments, as is fully set forth in Mr. Charles H. Proctor's article on "Verde Antique" in the January issue, 1905, of THE METAL INDUSTRY. In connection with using pigments after the work is prepared as prescribed, a solution of 8 oz. of sulphate of copper in each gallon of water should be used for oxidizing. In the first place this gives a greenish tone to the article and then, when pigments are applied, the effect is better than when using chemical solutions.

READERS' OPINIONS.

Correspondence is solicited from all of our readers on subjects relating to the founding, finishing, rolling and plating of the non-ferrous metals and alloys. Name and address must be given, though not necessarily for publication. Address THE METAL INDUSTRY, 61 Beekman street, New York.

THE CURRENT STRENGTH IN PLATING.

To the Editor of THE METAL INDUSTRY:

I have been reading with interest your September issue and you are quite right in saying that platers as a rule do not in the least understand the electric current and think all they need is voltage. Some of them use a voltmeter, but some of them do not even know the use of such an instrument. The amperemeter is used but very rarely, whereas in fact it is not the voltage but the amperage that does the work. A four-volt machine of 300 amperes is what should be used in plating silver. The voltmeter should be used to determine if the power is steady and an amperemeter should be used in each bath to determine the amount of silver deposited in a given time.

The condition of the solution has nothing to do with the amount of silver deposited, but determines only the value or condition of the deposit. If the solution is rich in silver it offers less resistance. One ampere will deposit 2½ dwt. in one hour, it matters not what the condition of the solution. If 100 articles are to be placed in the bath and the amount of silver desired to be deposited on the 100 articles equals 20 dwt. and if the rheostat is regulated so that the amperemeter registers 8 amperes, then those 20 dwt. will be deposited in one hour. If the rheostat is regulated for 16 amperes then 20 dwt. will be deposited in half an hour. The time of deposit is regulated by the quality of the deposit desired.

A. E. H.

NEW ROLLING MILLS.

The Wallingford Metal Company is the title of a new company recently organized and which will build a rolling mill at Wallingford, Conn. The incorporators are: Frank P. Welton, Abel Kenworthy and Robert D. Somers. The capital stock is $150,000. The company has bought six acres of land located on a siding of the railroad near R. Wallace & Sons' factory and will put up a one-story brick building 160 x 160 feet. A casting shop of 60 x 100, boiler power house of 40 x 50. This is to be the first unit which is expected will eventually grow into a large mill. The company will at first roll German silver and other specialties in bronze, etc., according to the trade requirements. The three organizers of the Wallingford Metal Company are all practical men, each being respectively a master caster, master roller and master mechanic, and as the present rolling mills are taxed to their utmost capacity to supply the trade demands, it is believed the new mill will start at a favorable time. All particulars about the machinery, materials and supplies for the new mill can be obtained by writing to the Kenworthy Engineering Company, of Waterbury, Conn., who have charge of the plans and contracts.

Reports received from the West say that the Western Copper Manufacturing Company, of Chicago, Ill., will expend $750,000 at Indiana Harbor. This company has bought from the East Chicago Company ten acres at the junction of the Indiana Harbor Railroad and the Chicago Terminal Transfer Company, and will begin shortly the construction of a copper and brass rolling mill. The first to be erected will be a sheet mill for manufacturing copper. The building with power house will cost $200,000, and will give employment to 250 hands. When this building is finished a tube mill will be built representing an investment of $250,000. The capacity of the sheet mill is mentioned to be 18,000 tons a year. E. C. Potter, son of O. W. Potter, is president of the company, and writes us that the above information is correct.

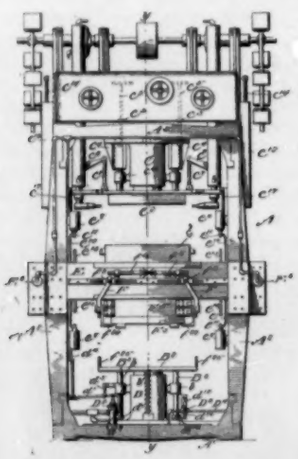
The United States Brass and Copper Corporation have taken offices at 42 Broadway, New York. They were incorporated last April under the laws of the State of Delaware for $1,000,000, and have issued $600,000 thirty-year 5 per cent. sinking fund gold bonds. The company purposes to build a brass and copper rolling mill at New Castle, Pa., which is 50 miles north of Pittsburg, and where the company have acquired 30 acres of land. It is stated that the Board of Directors will consist of the following: E. H. Goodwin, Philadelphia, Pa.; John Hartness Brown, Cleveland, O.; C. J. Kirk, New Castle, Pa.; William M. Brown, New Castle, Pa.; Ferdinand Deming, Waterbury, Conn., and G. Weaver Loper, New York.

The Derby Iron Foundry, of Derby, Conn., is building a cinder crusher for the Waterbury Manufacturing Company. The company reports that they have equipped some of the largest brass mills with their cinder crushers and other machinery.

PATENTS

A full copy of any Patent mentioned will be furnished for Ten Cents. Address THE METAL INDUSTRY, 61 Beekman Street, New York.

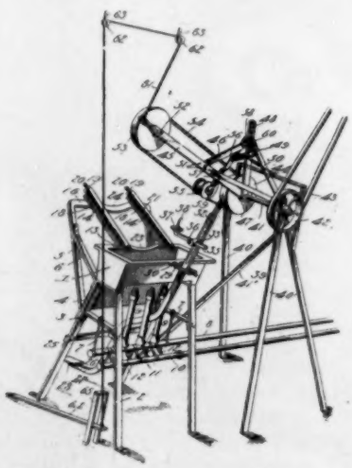
798,675. Sept. 5, 1905. MOLDING MACHINE. F. W. Hall, Camden, N. J.—The object of this invention has been to provide a machine whereby the various operations, such as ramming the sand about the patterns, the handling and assembling of the drag and cope sections to complete the flask, the withdrawal of the patterns after the ramming and the movement of the table to position between the ramming devices and to one side for recharging the cope and the drag with sand should be automatically accomplished as far as possible. Referring to the adjoining figure the machine is composed of a main frame A consisting of a base A^1, from which rise the side uprights A^2, connected at the top by a top plate A^3. The side uprights are provided with a transverse slot for the table, so as to move the latter into position beneath a suitable sand hopper for the purpose of supplying the drag and cope with sand. A lower ramming cylinder B is mounted upon the base A^1; within the cylinder works a plunger B^1, which carries at its upper portion a ramming head or plate B^2. Springs b^1 are interposed between the under side of the plate or head for the



purpose of cushioning the downward movement of the plunger B^1 and preventing shock. A suitable pipe for supplying compressed air or other fluid is also provided. The upper frame A^3 carries the ramming cylinder, in which works a plunger C^1, the latter carries the head or plate C^2, to which is secured the rammer plate or board, which is to enter the cope and ram the sand. The rammer plate has beveled or undercut edges c, whereby the sand in the cope is packed tightly at the edges and around the patterns. Guide lugs are also provided as well as hand wheels, by which the cylinder may be adjusted up or down to suit the size of the cope which is to be rammed. Provision is also made by suitable mechanism for the return movement of the upper plunger after the ramming action, the construction being described in detail in the specification. A further compensation is introduced for the adjustment of the returning mechanism of the upper cylinder. It is desirable that both the lower and upper plungers shall act simultaneously during the operation. All the details of the invention are described in the specification, which is quite lengthy and provided with a number of illustrations.

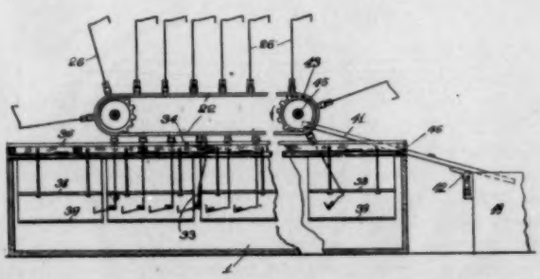
798,354. August 29, 1905. PUNCH CUTTING MACHINE.—J. W. Lewis, Philadelphia, Pa. The machine is intended to provide means whereby it is possible to cut punches with their cut letters all of the same height with a different width by the use of the same pattern, and also to cut punches with the letters of the same width but of different height with the same pattern, thus necessitating the use of but a single pattern to cut punches into different sized letters of the same relative proportion or with letters of different relative proportions. The construction of the apparatus is described in detail, and it consists essentially of supporting standards, a swinging frame, which includes a pointer and a universal joint which connects the swinging frame to the supporting standards.

798,871. Sept. 5, 1905. SOLDERING MACHINE.—T. Bumann, Litchfield, Ill. The soldering machine shown in the adjoining illustration is constructed for soldering all kinds of round vessels and includes adjustable mechanism adapted for use in different sizes of the vessels. Provision is also made for holding the articles which are to be soldered, and moving or revolving the latter during the soldering operation by a band. During this soldering operation the articles are held in the melted solder at a suitable depth in order to secure top, bottom or end seams. The apparatus consists of a soldering pot or tank 1, which is suitably supported and heated by a number of Bunsen burners 9, fed by air pipe 10 and gaspipe 8. The vessel rotating device comprises the arm 45, pulleys 44-43 and a band 54. As shown in the figure it is elevated,



but its normal position is close to the rolls 21. Before the rotation of the vessel to be soldered is permitted to take place, the arm 35 and the wheel 37 are arranged to properly engage the vessel so as to prevent it from being depressed too far into the pot. The treadle 26 causes this to be permitted as long as it remains in a lowered position, so that the wheel 37 can engage the vessel. An acid or soldering fluid is applied to the seam with a small brush, while the vessel is being revolved. After the vessel has been fully engaged by the solder within the tank, it is thrown upwards by depressing the treadle 26 and the surplus solder is removed from the seam by the use of a wire brush, which is pressed against the vessel or device while it is revolved. The mechanism is described in detail and is stated to be convenient for use on vessels of different dimensions.

799,402. Sept. 2, 1905. ELECTROPLATING APPARATUS—Louis Potthoff, Brooklyn, N. Y. The apparatus as shown in the accompanying cut in longitudinal section comprises a chain or belt 22, which carries a number of cross bars with a depending lock or eye portion. The cathode terminals 26 are arranged in the shape of hooks, which are to carry the bars or rods to be galvanized.



Each hook is made of heavy wire and covered with insulation, except where the bars rest. The two ends of each hook are looped in order to engage the ends of the cross bars. The bars or rods to be galvanized are first placed on the supports at the left end

PATENTS

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of the tank and by means of downwardly projecting brushes are pushed down so that they fall far enough to clear the lower end of the brushes. By this means the contact between the hooks and the bars will be automatically shifted by the movement of the chain. The anodes 38 and 39 are arranged one above and one below the hooks. For the automatic discharge of the work as it comes out of the solution, a pair of vibrating arms 41 are provided, which are automatically spread apart to allow a hook carrying a bar to pass, and then spring together to catch the bar as it drops from the hook, after which the bar slides down the arms 41 to the table or tank 19.

796,726. August 8, 1905. MACHINE FOR FORMING WIRE DRAWING DIES. J. A. Horton, Providence, R. I.—The invention aims at simplifying the operation and reducing the cost of reforming the orifice of a wire drawing die and to reduce the employment of skilled labor on the operation to a minimum. The mechanism is largely automatic and consists of die support and a tapered forming tool adapted to enter a die, which rests on this support. Means are provided for intermittently applying the tool to the die and for making the action of the tool progressive. The die-support is given a progressive movement so as to cause the swaying tool to enter the die more deeply at each successive blow.

TRADE NEWS

Trade News of Interest Desired from All our Readers. Address THE METAL INDUSTRY, 61 Beekman St., New York.

The new brass foundry of the N. B. Dodge Manufacturing Company, Easthampton, Mass., has been put in operation recently. It has three furnaces.

The Kalamazoo Plating Company is the name of a new concern which have established a plant in connection with the Model Brass Works, of Kalamazoo, Mich.

A new design of table flatware called "The Violet" has been put on the market by Simeon L. & George H. Rogers Company, of Hartford, Conn. It is finished in French gray.

The Wilmington Cornice Works have been incorporated at Wilmington, Del., with a capital of $100,000, to furnish trimmings and roofings of tin, zinc, copper and galvanized iron.

The Bridgeport Brass Company, of Bridgeport, Conn., are putting up an addition to their manufacturing department which will be a 40 x 40 three-story brick building and which will connect the front wings of their factory.

The Indian Aluminum Company, of Madras, India, issue a leaflet on their Aluminum Razor Strops, which they say are superior to those made of stone. The company is doing a good business in razor strops of aluminum.

The Mexican Aluminum Manufacturing Company, of Mexico City, have been organized recently and are selling stock. Assistant Secretary Condurier reports that as soon as all of their capital is subscribed they will operate a plant.

The Union Aluminum Company, of Doylestown, Ohio, have been incorporated with a capital of $25,000. The incorporators are: C. C. Ott, E. J. Mustell, Jacob Dettling, W. L. Codding. D. W. Kesler, S. F. Watkins and L. S. Sweitzer.

Richards & Co., metal dealers, of Boston, Mass., report that they are selling a great deal of Parsons Manganese Bronze for automobile castings. This bronze is strong enough for the purpose and can be machined according to the requirements.

It is expected that the new boiler plant of the Randolph & Clowes Rolling Mill, Waterbury, will be finished by the end of the year. It will contain a battery of boilers of 1,600 horse-power. The company is also putting in a new 700 horse-power engine.

A new product of the Carborundum Company, of Niagara Falls, N. Y., are carborundum paper and cloth discs for use on surface and disc grinding machines. They are made in all grits—very coarse for rough work and very fine for the finest finishing and polishing.

C. W. Moore, of Bridgeport, Conn., is extremely busy buying and selling metals all over New England and as far as New York and Pennsylania. He has one of the largest plants in the State of Connecticut for the handling of metals and is equipped to make prompt purchases and deliveries.

The Wire and Telephone Company of America, a new $600,000 corporation, have bought the plants of the Empire Wire Company and the Electric Works, of Rome, N. Y. The executive offices of the new company are at Rome and in addition to wire they will manufacture telephone apparatus.

Gold lacquer has been the specialty of the American Lacquer Company, of Bridgeport, Conn., for a number of years, and the makers say that it has the best lustre and wears the longest. It is particularly suitable for brass bedsteads and brass goods and is sold all over the United States and Canada.

The Coale Brass Manufacturing Company, of Baltimore, Md., have sold their entire plant to the Coale Muffler & Safety Valve Company, of New Jersey. The assets of the Coale Company were distributed among their shareholders after all debts had been paid, and the corporation have been dissolved.

The Waterbury Farrell Foundry & Machine Company, of Waterbury, Conn., have just shipped a rolling mill to the Denver Mint. The rolls were 8" x 10", electrically driven and of variable speed. The addition to the machine shop of the Waterbury Farrell Foundry is finished and the company is now moving in.

As we go to press the daily press reports the awarding of big contracts for American machinery and supplies by the British Admiralty and War Office. Among the companies mentioned receiving contracts were the Buffalo Forge Company, the American Gas Furnace Company and the Westinghouse Companies.

Through a typographical error the re-incorporation of the Frankfort Brass Works Company, of Frankfort, Ind., was stated in our September number to be the "Franklin Company." The Frankfort people will continue to manufacture gas and steam supplies with a specialty of steam and quick opening hot water radiator valves.

The Excelsior Brass Works, of Reading, Pa., on September 14th suffered a loss by fire, but the rebuilding of the destroyed part is already under way and is expected to be in readiness in October. The firm is overrun with orders for their gas portables and hotels goods and are taking on new men daily in order to supply their trade.

The Douglas & Lomason Company, of Detroit, Mich., manufacturers of carriage and sleigh rails, handles, name plates and hardware specialties, report that their factory is turning out 50 per cent. more goods this year than during the same months of 1904. The company are obliged to run overtime to take care of their increasing business.

The Austin Manufacturing Company, of Hartford, Conn., have incorporated with a capital stock of $25,000 and the following officers: R. M. Austin, president; D. H. Judd, treasurer; W. E. Johnson, secretary. The company will move into a larger building and put in new machines that they may be able to cope with their increasing business.

TRADE NEWS

Trade News of Interest Desired from All our Readers. Address THE METAL INDUSTRY, 61 Beekman St., New York.

L. W. Wilson, president of the Binghamton, N. Y., Chamber of Commerce, announces that a new brass foundry will be located in that city. It will be operated by William Hahn and Christopher Leschhorn, of Rochester, N. Y., and will be called the Binghamton Brass and Bronze Foundry Company. Both of the operators are practical foundry men.

We regret to report that the entire plant of the Roberts Chemical Company, Niagara Falls, N. Y., has been destroyed by fire. The company had built up a very successful business in the manufacture of caustic potash, which was used extensively by platers. As we go to press we are pleased to report that the company will take steps at once to rebuild the factory.

The Sterling Emery Wheel Manufacturing Company, of Tiffin, Ohio, announce that they have moved their store in Chicago from 65 South Canal street to 30 and 32 South Canal street, where they have a new and complete stock of abrasive wheels and grinding machinery. The managers of the Chicago store will be glad to receive catalogues of all kinds of machinery and supplies in their line.

The Sterling Silver Plating Company, of Sterling, Ill., will this month move their factory to Rock Falls. It is said that when they are located in their new plant they will have the largest independent plating factory in the State of Illinois. The shop will be thoroughly modern.

The United Copper Foundry Company have been incorporated at Boston, Mass., with $60,000 capital, with the following officers: Harry F. Curtis, president; Albert W. Mullin, treasurer; Arthur E. Hatch, clerk. The office is at 11 High street and foundry at Medford, Mass. The company will make hard and soft copper castings, copper trolley wheels and bushings, composition, brass, aluminum, etc.

The new refinery of the National Metal Company, located near the City of Mexico, Mex., is expected to be in operation during October. It is the first plant of its kind established in the southern part of the Mexican Republic. The equipment will include eight furnaces, three Dore, three retort and two melting, and the refinery will be able to handle metals to the value of $600,000 in gold per month.

Frederic B. Stevens, a manufacturer and seller of polishers', platers' and founders' supplies at Detroit, Mich., has recently bought the stock, formulas and good will of the Zircon Manufacturing Company, of North Tonawanda, N. Y. The Zircon Company have ceased manufacturing polishers' and platers' composition and Mr. Stevens will continue to make their brands, but not at Tonawanda.

Proposals will be received at the Bureau of Supplies and Accounts of the Navy Department, Washington, D. C., until 10:10 A. M., October 10th, 11th, 24th and 31st, for a variety of supplies and machinery, including brass pipe, sheet brass and copper, sheet lead and pipe, sheet zinc, copper tubing, Tobin bronze, and other products which are furnished by the non-ferrous metal industry and kindred interests.

The Zucker & Levett & Loeb Company, of New York City, have just furnished the Westinghouse Electric & Manufacturing Company, of East Pittsburg, Pa., a complete cold galvanizing plant which includes revolving plating apparatus, cleaning tanks, suspending tanks and dynamos. The design and estimate of the equipment was drawn up by Superintendent Backus, of the Zucker & Levett & Loeb Company.

The Dow Chemical Manufacturing Company, of Mansfield, Ohio, are putting on the market a line of "Leader" Dynamos and Motor Dynamos built especially for electro-plating and electrolytic establishments. The company announce that they are also in a position to furnish complete outfits, including anodes, grinding and polishing machinery, chemicals and other supplies and machinery required by platers and polishers.

The Rimmon Manufacturing Company, of Seymour, Conn., have grown so in the last four years that they have been in business that they will have to remodel their factory and expect to put up a good brick building which will replace their present frame building and give them the additional room they require. At present they are erecting a new brick engine room. The company manufacture German silver goods, novelties, etc.

The Waterbury Crucible Company, situated at Waterbury, Conn., the home of the brass industry of the United States, announce that though they have the newest of the crucible plants they have had thirty years' experience in the manufacture of crucibles. Their factory is operated by electric power, has new machinery and equipment. They manufacture crucibles for melting all kinds of metals and make to order special sizes and shapes.

The Syracuse Aluminum and Bronze Company has been incorporated with a capital of $25,000, with the following incorporators: Willard C. Lipe, Alexander T. Brown, Willis H. Diefendorf, Charles L. Ackerson, H. Winfield Chapen. The company have secured the plant of the Stearns Steam Carriage Company, of Syracuse, N. Y., remodeled it into a thoroughly up-to-date foundry for the manufacture of aluminum, brass and bronze castings of all kinds. The company will make a specialty of automobile and marine engine work and is now doing business.

Walsh's Sons & Co., of Newark, N. J., the well-known wreckers and dismantlers of structural buildings and other material, are now engaged in a very difficult undertaking, that of removing a very large steel structure near Albany, N. Y., which will require considerable engineering skill on account of the hampered conditions surrounding the work. There is such close quarters to prohibit the ordinary methods through fear of injuring persons and property nearby. As the firm is capable of bringing such work to a successful conclusion, they will no doubt have it finished on time.

"The Monarch" crusher and pulverizer, made by O. J. Mousette, Driggs avenue and North Tenth street, Brooklyn, N. Y., is meeting with success, and inquirers are coming in every day from home and abroad. Among the concerns who have one or more of these machines in successful operation are the following: Colonial Smelting and Refining Company, Philadelphia, Pa.; Ajax Metal Company, Philadelphia, Pa.; Brooklyn Copper Refinery, Brooklyn, N. Y.; Martin Reynolds & Son, Brooklyn, N. Y.; Nathan Manufacturing Company, New York, and Alderman & Johnson, Jersey City, N. J.

On another page will be found a varied list of second-hand machinery in first-class condition and in good working order, which is offered for sale by the C. C. Wormer Machinery Company, 23 to 29 Wayne street, Detroit, Mich. The assortment includes turret lathes, polishing and buffing lathes, drills, valve milling machines, screw slotter, spinning lathes and other machine tools needed by non-ferrous metal workers. It will pay metal workers who need machinery to look over the list. The C. C. Wormer Machinery Company report that business is very good both in second-hand and new machinery.

The International Acheson Graphite Company, of Niagara Falls, N. Y., have doubled the capacity of their plant for creating graphite in the electric furnace, and have closed a contract with the Niagara Falls Power Company for another 1,000 horse-power of electrical energy in addition to the 1,000 horse-power previously used. The commercial importance of this artificial graphite may be estimated from the fact that the United States Geological Report for 1904 states that for that year the value of Acheson Graphite produced was $217,790, while all the graphite mined in this country amounted to $341,372.

"Satin Finish" is the name of a new and popular grade of lacquer put on the market by the New Era Lustre Company, of New Haven, Conn. The lacquer does not put the satin finish

TRADE NEWS

Trade News of Interest Desired from All our Readers. Address THE METAL INDUSTRY, 61 Beekman St., New York.

on the goods, but is a lacquer specially suitable for applying to satin finished goods and also to high grade bright goods. The makers say that their satin finish brand is absolutely transparent, clear and hard and better than the ordinary run of lacquers. As the prices have declined of the raw material used in the manufacture of the lacquer, the New Era Lustre Company are selling their goods at reduced prices according to the drop in materials, with no lowering of the quality of the lacquer.

NEW CATALOGUES

Patterson, Gottfried & Hunter, Limited, new catalogue on Power Transmission Appliances, a review of an advanced edition of which was published in the September number of THE METAL INDUSTRY, is now ready for distribution. As mentioned, this catalogue gives valuable information on power transmission appliances.

"Price List and Table Book" is the title of a neat booklet issued by C. G. Hussey & Co., proprietors of the Pittsburg Copper & Brass Rolling Mills, of Pittsburg, Pa. The booklet contains rules for ordering copper, price list of all kinds of rolled copper and tables giving the gauges and weights of sheet copper and brass. The booklet will be useful to all users of sheet copper.

"Machinery for Manufacturing Pierced Tin and Ironware" is the title of a new catalogue just issued by the E. W. Bliss Company, of Brooklyn, N. Y. As much of the machinery illustrated and described is used in the fabrication of brass, copper and aluminum articles, the catalogue is also of interest to the manufacturers of goods in these metals. The catalogue is finely illustrated with half-tone engravings and contains some interesting facts about machinery.

With a polar bear on the cover, the U. S. Electro Galvanizing Company, of Brooklyn, N. Y., issues a new catalogue on "Patent Cold Galvanizing Process." The company state that they are exclusively authorized to sell licenses of Potthoff's Cold Galvanizing, handling devices, etc., and by use of their patent devices the plating of any kind can be reduced to about one-half of its present cost. The catalogue gives a comprehensive description of the art of cold galvanizing and also testimonials from a number of prominent firms who have installed the apparatus of the U. S. Electro Galvanizing Company.

A very complete catalogue on plating outfits and supplies has just been issued by the Bennett & O'Connell Company, of Chicago, Ill. The catalogue starts with the dynamo and takes up the electrical instruments used in connection with it. The following pages are devoted to complete descriptions of polishing, buffing and grinding lathes, anodes, rotary barrels and the solutions and supplies used by platers and metal workers. The catalogue is of 122 pages and is indexed. In the last pages there is a description of antidotes for poisons used in the plating room and the useful information on transmission of power.

MEETINGS

Commissioner Webster reports that a most successful meeting of the Association of American Brass Manufacturers was held at the Imperial Hotel, New York, on September 5 and 6. Two important committees were appointed, one for the purpose of devising a uniform plan or system for figuring costs in the brass business, the association believing that the proper presentation of this subject to brass manufacturers will reduce a large amount of harmful competition. This committee consists of the following members: W. H. Wasweyler, chairman, Milwaukee, Wis.; C. H. Lindemer, Pt. Washington, Wis.; J. H. Glauber, Cleveland, Ohio; Theo. Ahrens, Jr., Louisville, Ky.; A. S. Hills, Haydenville, Mass. A standing committee of three was also appointed for the consideration and adjustment of lists, consisting of the following members: J. H. Glauber, chairman, Cleveland, Ohio; H. M. Hoelscher, Chicago, Illl.; A. S. Hills, Haydenville, Mass. Usually it has been the custom to bring about any changes that are to be made in lists on brass goods the first of the year. The association ordered that there should be no changes this coming year. The prices were advanced at the meeting about 10 per cent. The following new members were elected: The Reliance Manufacturing Company, Salem, Ohio; the Jefferson Brass Works, Watertown, N. Y.; the Wisconsin Brass Works, Port Washington, Wis.; the Detroit Brass and Supply Company, Detroit, Mich. The asssociation decided to meet in Cleveland in December.

PERSONALS

Michael Hayman, senior member of Michael Hayman & Co., smelters, of Buffalo, N. Y., has started on a European business trip of a few weeks.

Robert C. Swayze, secretary of the Torrington Manufacturing Company of Torrington, Conn., has returned from his European trip, where he made an inspection of the foreign machinery used in the finishing of non-ferrous metals.

Harrison Johnson, of the Standard Plating Works, of Philadelphia, Pa., has been appointed receiver of the Metal Manufacturers Supply Company of the same city. Mr. Johnson will take the business in hand and realize upon the assets.

Dugald H. Roberts, formerly vice-president of the McRae & Roberts Company, of Detroit, Mich., has withdrawn from that company and is organizing a new concern to manufacture steam brass goods. Mr. Roberts stock has been bought by W. D. McRae, president of the McRae & Roberts Company; Howard B. Anthony, the secretary and treasurer, and by other stockholders.

We received word from Alex. McMillan, American vice-consul at Winnipeg, Manitoba, Canada, that he has taken an interest in the copper welding process invented by a local blacksmith of Winnipeg, and which was mentioned in the September number of THE METAL INDUSTRY. By an agreement with the inventor, Mr. McMillan has the power of attorney to dispose of it or handle it in any way and will be glad to answer any inquiries regarding it.

DEATHS

Albert T. Salt, proprietor of the Atlas Silver Foundry at Attleboro, Mass., died suddenly at the door of his home August 5. Mr. Salt was formerly employed with the Gorham Manufacturing Company, of Providence, R. I. In 1903 he started a foundry at Providence, and owing to his increasing business recently moved to Attleboro. Since his death his foundry has been closed, but the disposition of the plant is now in the hands of Lawyer Ralph Estes, of Attleboro, Mass. Mr. Salt was 35 years old and leaves a wife and three daughters.

METAL MARKET REVIEW

COPPER.—The fluctuations in the London market in standard copper have been less violent. Spot opened at £70 7s. 6d. and after declining to £68 12s. 6d. (the lowest point of the month) on Sept. 7th prices gradually advanced to £71 on the 26th, closing at £71 2s. 6d. The features in the London market have been the heavy selling in that market by the London representative of a leading American firm and later the withdrawals of Chili Bars for American account.

The sensational rapid advance in prices towards the close of last month uncovered a heavy short interest in the New York market in more quarters than one and the heroic and persistent endeavors of these same bears to depress prices have been the interesting features to note during the entire month. However, they were unsuccessful, for the market, as we have followed it, has ruled strong at around 16½ for Lake and Electro for the entire month. With the leading producer practically out of the market and the smaller producers pretty well sold up for the balance of

TRADE NEWS

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the year, there has been and still is a scarcity of spot stocks, and some of the best posted members of the trade predict a firm market for the balance of the year. Trade is good and foundries and mills are all full of orders. The exports for the month will total close to 20,000 tons when all the returns are in, but this is all on old business. Europe is not buying our copper to-day and the stocks of Electro shipped to China are being offered for resale. The market here was undoubtedly considerably oversold, but with the tension due to that condition gradually diminishing we look for a generally easier market though at the close the market was strong with 17 cents paid for spot Lake. Sales running over the first six months of 1906 have been made at 16 cents, but we see nothing in the situation to warrant any rush to cover at those prices to-day.

TIN.—The London tin market has suffered from the usual speculative fluctuation. Spot tin opened at £147 15s., declined to £144 15s. on the 19th, and closed at £146 15s.

The New York market, owing to fairly heavy arrivals, has ruled generally below the London parity. Statistically the position of the tin market is sound and well under control, with a good home demand, and conditions at present writing are very favorable. We should have a steadily increasing consumption and a call for tin from the London market. At the close we quote the market steady, 5 and 10 ton lots spot, 32.15, smaller lots, 32.25. November and December delivery, 32.10.

LEAD.—The foreign lead market has ruled fairly high, opening at £14 8s. 9d. Price dropped to £13 15s., the lowest, and closes at £14 1s. 3d.

There has been no change in the domestic market. The leading interest arbitrarily fixed the New York shipment price at 4.85 last month and 4.85 it is to-day. Carload lots spot, New York, 4.90; small lots, 5 cents.

SPELTER.—The foreign spelter market has advanced £1 10s. during the month from £26 at the opening to £27 10s. at the close.

In St. Louis the market at the close is quotable at 6 cents to 6.05. New York market has followed the Western advance and prices at the close from 25 to 30 points higher than a month ago. New York shipment is quotable at 6.05; carload small lots, 6.10 to 6.15.

ANTIMONY.—As foreshadowed in our summary of last month, the prices of antimony have rapidly declined and rule to-day fully 1½ cents below our last quotations. Cookson to-day, 13.50; Hallett's, 13, and other brands, 12.50 to 12 cents.

SILVER.—The London silver market has ruled steady with very slight fluctuations. Opened at 28 1-16 and closed at 28 7-16.

There has been no special features to note in the New York market and prices have a slight advance for the month. The official price closing at 61½c., against 60¾c. a month ago.

OLD METALS.—The market for all kinds of scrap brass and copper has been active and prices have held firm in sympathy with the high copper markets. Light brass is quotable at 8½ cents, heavy brass at 9¾ to 10 cents, and turnings at 9½ cents. Zinc dross is in demand; 4.75 has been paid for carload lots, and dealers are asking 4.80 at the close. The export price rules at $95 to $96 per ton.

TRADE WANTS

ANSWERS SENT IN OUR CARE WILL BE FORWARDED.

ACCOUNTING AND AUDITING BOOKS written up, balances taken off. Profit and loss statements and balance sheets and reports made. Small accounts solicited; high-class work done. Charges reasonable. JOHN C. ALMOUR, 257 Broadway, New York City.

WANTED TO MANUFACTURE CAST BRASS SPECIALTIES of all descriptions, or will manufacture good patented specialty on royalty. SHEELER HEMSHER CO., 811, 813, 815 Fairmount avenue, Philadelphia.

WANTED—Foreman for small brass foundry. Machine work. Man capable of getting out sound yellow brass castings. Address BRASS, care THE METAL INDUSTRY.

WANTED—A lot of good second-hand buff lathes. Address P. O. Box No. 1036, Waterbury, Conn.

WANTED—A good steady plater for a San Francisco factory. Eastern man preferred. Will pay $3.50 a day. Steady job for a sober man. Address SAN FRANCISCO PLATER, care THE METAL INDUSTRY.

POSITION WANTED as foreman in a Boston or New York City foundry. Have had charge of making castings weighing 250 pounds and have been in charge of 60 men. Address BRASS FOUNDRY FOREMAN, care THE METAL INDUSTRY.

WANTED—Foreman in a brass pump cylinder department. Address, stating experience, PUMP FOREMAN, care THE METAL INDUSTRY.

WANTED—Salesman to sell crucibles; give age, experience and salary expected. Address BRASS CRUCIBLE, care THE METAL INDUSTRY.

WANTED—WORKING SUPERINTENDENT in a sheet metal manufacturing company. Must be conversant with plain, combination and drawing dies, the estimating of costs, and the handling of help, and a hustler to get out work. A good chance for a live man to get up and on. Address SUPERINTENDENT, care THE METAL INDUSTRY.

WANTED—Firm to manufacture Bower-Barff iron background for sign manufacture. Address BOWER-BARFF, care THE METAL INDUSTRY.

WANTED—Machine that will curve brass borders to one-quarter of a circle. Address BRASS BORDER, care THE METAL INDUSTRY.

POSITION WANTED with reliable firm by a plater who is an expert on solutions and hustler on all colors. Understands silver deposit on glass and china. Address PLATER FOREMAN, care THE METAL INDUSTRY.

CASH PAID for old precious metals and minerals in any form. Gas mantle dust, bronze powder, bismuth, platinum, mercury, nickel, etc. Address JOSEF RADNAI, 284 Pearl street, New York City.

WANTED.—A first-class salesman well acquainted with the metal market. Fine opening for the right man. Address with full particulars MANUFACTURER, care THE METAL INDUSTRY.

SILVERSMITH desires position as mounter. Experienced on church plate work. Address SILVERSMITH, care THE METAL INDUSTRY.

FOR SALE.—Three Hill barrels for recovering metal from brass ashes. First-class condition. Address HILL BARREL, care THE METAL INDUSTRY.

ROLLING MILL EQUIPMENT FOR SALE.—One stand, 16x32, and one stand 17x24 chilled rolls, with two sets driving gear, all complete. One 4 ft. by 8 ft. annealing furnace. One No. 4 Cincinnati geared squaring shear, 36 in. knife. One No. 205 Niagara circle and slitting shear. One heavy Farrell foundry slitting shear, slits 3-16 stock, in use only one year and practically new. Also 12x30 Corliss engine and boiler complete; used to drive above, and several other items, pickle and water tubs, etc., for use in rolling sheet silver, brass or kindred metals. Address ROLLING EQUIPMENT, care THE METAL INDUSTRY.

INFORMATION BUREAU

Subscribers intending to purchase metals, machinery and supplies and desiring the names of the various manufacturers and sellers of these products can obtain the desired information by writing to THE METAL INDUSTRY. Our Information Bureau is for the purpose of answering questions of all kinds. Send for circular.

Metal Prices, October 5, 1905

METALS

	Price per lb
TIN—Duty Free.	
Straits of Malacca	32.50
COPPER, PIG, BAR AND INGOT AND OLD COPPER—Duty Free. Manufactured 2½c. per lb.	
Lake	16.75
Electrolytic	16.75
Casting	16.50
SPELTER—Duty 1½c. per lb.	
Western	6.05
LEAD—Duty Pigs, Bars and Old 2⅛c. per lb.; pipe and sheets 2½c. per lb.	
Pig Lead	4.90
ALUMINUM—Duty Crude, 8c. per lb. Plates, sheets, bars and rods 13c. per lb.	
Small lots	37.00
100 lb. lots	35.00
1,000 lb. lots	34.00
Ton lots	33.00
ANTIMONY—Duty ¾c. per lb.	
Cooksons	13.50
Hallets	13.00
Other	12.50
NICKEL—Duty 6c. per lb.	
Large lots	45 to 50
Small lots	50 to 75
BISMUTH—Duty Free	$1.50 to $2.00
PHOSPHORUS—Duty 18c. per lb.	
Large lots	45
Small lots	65 to 75
	Price per oz.
SILVER—Duty Free	$0.61¼
PLATINUM—Duty Free	21.00
GOLD—Duty Free	20.67
QUICKSILVER—Duty 7c. per lb. Price per Flask.	41.00

Zinc—Duty, Sheet, 2c. per lb. 600-lb. casks, 7.50 per lb., open, 8.50 per lb.

Tobin Bronze—Rods, Unfinished, 20c.

Tobin Bronze—Rods, Finished, 21c.

PRICE FOR ALUMINUM BRONZE INGOTS.

	Per pound
2½ per cent	19c.
5 per cent	19½c.
7½ per cent	20½c.
10 per cent	21½c.

Manganese Bronze, Ingots	16 to 17c.
Phosphor Bronze, Ingots	16 to 20c.
Silicon-Copper, Ingots	32 to 36c.

OLD METALS

Heavy Cut Copper	15.25	15.75
Copper Wire	15.25	15.50
Light Copper	13.75	14.00
Heavy Mach. Comp	13.50	14.00
Heavy Brass	10.75	11.00
Light Brass	9.00	9.25
No. 1 Yellow Brass Turnings	9.50	9.75
No. 1 Comp. Turnings	12.00	12.25
Heavy Lead	4.25	4.50
Zinc Scrap	4.25	4.50
Scrap Aluminum, sheet, pure	22.00	25.00
Scrap Aluminum, cast, alloyed	12.00	18.00
Old Nickel	15.00	25.00
No. 1 Pewter	20.00	21.00

PRICES OF SHEET COPPER

SIZES OF SHEETS.		96oz. & over 75 lb. sheet 30x60 and heavier	64oz. to 96oz. 50 to 75 lb. sheet 30x60	32oz. to 64oz. 25 to 50 lb. sheet 30x60	24oz. to 32oz. 18¾ to 25 lb. sheet 30x60	16oz. to 24oz. 12½ to 18¾ lb. sheet 30x60	14oz. and 15oz. 11 to 12½ lb sheet 30x60
		CENTS PER POUND.					
Not wider than 30 ins.	Not longer than 72 ins.	21	21	21	21	21	22
	Longer than 72 ins. Not longer than 96 ins.	21	21	21	21	21	22
	Longer than 96 ins.	21	21	21	21	21	23
Wider than 30 ins. but not wider than 36 ins.	Not longer than 72 ins.	21	21	21	21	21	23
	Longer than 72 ins. Not longer than 96 ins.	21	21	21	21	21	23
	Longer than 96 ins. Not longer than 120 ins.	21	21	21	21	22	24
	Longer than 120 ins	21	21	21	22	23	
Wider than 36 ins. but not wider than 48 ins.	Not longer than 72 ins.	21	21	21	22	23	25
	Longer than 72 ins. Not longer than 96 ins.	21	21	21	22	24	26
	Longer than 96 ins. Not longer than 120 ins.	21	21	21	23	25	29
	Longer than 120 ins.	21	21	22	24	27	
Wider than 48 ins. but not wider than 60 ins.	Not longer than 72 ins.	21	21	21	22	24	27
	Longer than 72 ins. Not longer than 96 ins.	21	21	21	23	25	30
	Longer than 96 ins. Not longer than 120 ins.	21	21	22	24	27	
	Longer than 120 ins	22	22	23	25	29	
Wider than 60 ins. but not wider than 72 ins.	Not longer than 96 ins.	21	21	22	24	29	
	Longer than 96 ins. Not longer than 120 ins.	21	21	23	26	31	
	Longer than 120 ins.	22	22	24	29		
Wider than 72 ins. but not wider than 108 ins.	Not longer than 96 ins.	22	22	24	27		
	Longer than 96 ins. Not longer than 120 ins.	23	23	25	28		
	Longer than 120 ins.	24	24	26	30		
Wider than 108 ins.	Not longer than 120 ins.	25	25	27			
	Longer than 120 ins.	26	26	29			

Rolled Round Copper, ¾ inch diameter or over, 21 cents per pound. (Cold Drawn, Square and Special Shapes, extra.)

Circles, Segments and Pattern Sheets three (3) cents per pound advance over prices of Sheet Copper required to cut them from.

All Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, one (1) cent per pound over the foregoing prices.

All Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, two (2) cents per pound over the foregoing prices.

Cold Rolled and Annealed Copper, Sheets and Circles, wider than 17 inches, take the same price as Cold or Hard Rolled Copper of corresponding dimensions and thickness

All Polished Copper, 20 inches wide and under, one (1) cent per pound advance over the price for Cold Rolled Copper.

All Polished Copper, over 20 inches wide, two (2) cents per pound advance over the price for Cold Rolled Copper.

Planished Copper, one (1) cent per pound more than Polished Copper.

Cold Rolled Copper prepared suitable for polishing, same prices and extras as Polished Copper.

Tinning Sheets, on one side, 2½c. per square foot.

For tinning both sides, double the above price.

For tinning the edge of sheets, one or both sides, price shall be the same as for tinning all of one side of the specified sheet.

Metal Prices, October 5, 1905

Net Cash Prices.

COPPER BOTTOMS, PITS AND FLATS.

14 oz. to square foot, and heavier, per lb.....25c.
Lighter than 10 oz.....31c.
10 oz. and up to 12 oz.....28c.
12 oz. and up to 14 oz. to square foot, per lb.....26c.
Circles less than 8 in. diam., 2c. per lb. additional.
Circles over 13 in. diam. are not classed as Copper Bottoms.
Polished Copper Bottoms and Flats, 1c. per lb. extra.

PRICE LIST FOR ROLL AND SHEET BRASS

Prices are for 100 lbs. or more of sheet metal in one order. Brown & Sharpe's Gauge the Standard.

Common High Brass	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Wider than and including	2 12	12 14	14 16	16 18	18 20	20 22	22 24	24 26	26 28	28 30
To No. 20 inclusive..	.22	.23	.25	.27	.29	.31	.33	.36	.39	.42
Nos. 21, 22, 23 and 24	.22	.24	.26	.28	.30	.32	.34	.37	.40	.43
Nos. 25 and 26.....	.23	.24½	.27	.29	.31	.33	.35	.38	.41	.44
Nos. 27 and 28.....	.23	.25	.28	.30	.32	.34	.36	.39	.42	.45

Add ½ cent per lb. additional for each number thinner than Nos. 28 to 38, inclusive.

Add 7 cents per lb. for sheets cut to particular lengths, not sawed, of proportionate width.

Add for polishing on one side, 40 cents per square foot; on both sides, double this price.

Brazing, Spinning and Spring Brass, 1 cent more than Common High Brass.

Extra Quality Brazing, Spinning and Spring Brass, 2 cents more than Common High Brass.

Low Brass, 4 cents per lb. more than Common High Brass.

Gilding, Rich Gold Medal and Bronze, 7 cents per lb. more than Common High Brass.

Discount from list 25 per cent.

PRICE LIST FOR BRASS AND COPPER WIRE

BROWN & SHARPE'S GAUGE THE STANDARD.	Com. High Brass	Low Brass	Gilding Bronze and Copper
All Nos. to No. 10, Inc	$0.23	$0.27	$0.28
Above No. 10 to No. 16	.23½	.27½	.28½
Nos. 17 and 18	.24	.28	.29
" 19 and 20	.25	.29	.30
No. 21	.26	.30	.31
" 22	.27	.31	.32
" 23	.28	.32	.33
" 24	.30	.34	.35

Discount, Brass Wire, 25 per cent.; Copper Wire, 25 per cent.

PRICES FOR SEAMLESS BRASS TUBING.

From 1¼ in. to 3½ in. O. D. Nos. 4 to 13 Stubs Gauge, 20c. per lb.
Seamless Copper Tubing, 23c. per lb.
For other sizes see Manufacturers' List.

PRICES FOR SEAMLESS BRASS TUBING Iron Pipe Sizes

Iron Pipe size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Price per lb	28	27	22	21	20	20	20	20	20	20	20	21	22	24	26	27

BRAZED BRASS TUBING

Brown & Sharpe's Gauge the Standard.

Plain	Round	Tube,	¾	in.	up	to	2	in.,	to	No.	19,	inc.	Per lb $0 35
"	"	"	⅞	"	"		2½	"		"	19,	"	36
"	"	"	1	"	"		2½	"		"	19,	"	38
"	"	"	1⅛	"	"		2½	"		"	19,	"	41
"	"	"	1¼	"	"		2½	"		"	19,	"	48
"	"	"	1½	"	"		2½	"		"	19,	"	65
"	"	"	1¾	"	"		2½	"		"	19,	"	1 00
"	"	"	2	"	"		2½	"		"	19,	"	1 50

Smaller than ¾ inch.....Special
2 inch to 3 inch, to No. 19, inclusive..... 38
3 inch..... 40
Over 3 inch to 3½ inch..... 43
Over 3½ inch..... 50

Bronze and copper advance 3 cents. Discount 33 1-3 per cent.

PRICE LIST FOR SHEET ALUMINUM—B. & S. Gauge.

Wider than and including	*3 in. 12 in. in coils.	6 in. 14 in.	14 in. 16 in.	16 in. 18 in.	18 in. 20 in.	20 in. 24 in.	24 in. 30 in.	30 in. 36 in.	36 in. 40 in	Cutting to Length.	Polishing or Satin Finishing One side.
No. 13	42	42	44	44	44	44	47	47	47	1	2
" 14	42	42	44	44	44	44	47	47	47	1	2
" 15	42	42	44	44	44	44	47	47	47	1	2
" 16	42	42	44	44	44	44	47	47	47	1	2
" 17	42	42	44	44	44	44	47	47	47	1	3
" 18	42	42	44	44	44	44	47	47	50	1	3
" 19	42	42	44	44	44	44	47	48	51	1	4
" 20	42	44	44	44	44	46	49	50	52	1	4
" 21	42	46	46	46	46	48	51	52	58	2	5
" 22	42	46	46	46	48	48	51	55	59	2	5
" 23	42	46	46	46	48	48	51	57	60	2	6
" 24	42	46	48	50	50	50	53	59	62	2	6
" 25	44	47	49	51	51	51	54	61	65	2	7
" 26	44	47	50	54	54	54	59	63	69	2	8
" 27	44	48	52	56	56	57	62	66	72	2	10
" 28	44	48	54	56	57	57	64	70	75	2	11
" 29	46	49	56	58	60	60	69	75	80	2	13
" 30	46	50	58	60	64	70	77	80	85	2	15
" 31	48	52	60	63	68	76	79	82	88	3	17
" 32	50	54	62	66	74	82	89	95	100	3	19
" 33	52	56	65	70	78	89	96	05	115	3	21
" 34	55	60	67	75	83	96	108	115	125	3	25
" 35	.....	70	75	85	95	105	120	130	.....	.....	Polished or Scratch Brushed 2 sides double above prices.
" 36	.....	85	95	105	120	125	140	.....	.....	.....	
" 37	.....	100	110	125	140	155	170	.....	.....	.....	
" 38	.....	120	135	150	165	180	200	.....	.....	.....	
" 39	.....	140	160	180	200	220	.....	.....	.....	.....	
" 40	.....	170	200	220	240	.....	.....	.....	.....	.....	

In flat rolled sheets the above prices refer to lengths between 2 and 8 feet. Prices furnished by the manufacturers for wider and narrower sheeet. All columns except the first refer to flat rolled sheet. Prices are for 50 lbs. or more at one time. Less quantities 5c. lb. extra. Charges made for boxing.

Discounts as Follows are Given for Sheet Orders Over 200 Pounds.

200 to 1,000 pounds.....10 per cent. off list.
1,000 to 2,000 " 10 per cent. and 2 " "
2,000 to 4,000 " 10 " " 3 " "
4,000 pounds and over 10 " " 5 " "

PRICE LIST OF SEAMLESS ALUMINUM TUBING—STUBS' GAUGE.

STUBS' G.	1-4"	3-8"	1-2"	5-8"	3-4"	1"	1 1-2"	2"	2 1-2"	2 3-4"
4 to 11	.....	.....	96	86	83	77	67	61	61	61
12	.....	1 08	96	86	83	77	67	61	61	61
13	.....	1 08	96	86	83	77	67	64	64	64
14	.....	1 08	96	86	83	77	67	64	64	64
15	.....	1 12	96	89	86	80	70	67	67	67
16	..	1 15	99	93	89	83	70	70	70	70
17	...	1 18	1 02	96	93	86	73	73	73	73
18	1 85	1 24	1 05	99	93	86	77	77	77	80
19	1 88	1 28	1 08	1 02	99	93	83	80	80	83
20	1 95	1 31	1 15	1 08	1 05	99	89	86	86	89
21	2 01	1 37	1 21	1 15	1 12	1 05	99	93	93	96
22	2 17	1 44	1 24	1 18	1 15	1 08	1 05	99	1 05	1 05
23	2 33	1 50	1 31	1 24	1 21	1 15	1 15	1 08	1 15	1 15
24	2 48	1 60	1 37	1 31	1 28	1 18	1 21	1'21	1 24	.....
25	2 65	1 69	1 47	1 37	1 34	1 28	1 34	.....	.....	.....

Prices are for lots of 50 lbs. Boxing extra. Smaller, larger and intermediate sizes furnished by manufacturers.

Discounts as Follows are Given for Tube Orders Over 50 Pounds.

50 to 200 lbs..... 5 per cent. discount off list
200 to 2,000 lbs.....10 " " " " "
2,000 to 4,000 lbs.....10 and 3 " " " " "
4,000 lbs. and over.....10 and 5 " " " " "

PRICE LIST FOR ALUMINUM ROD AND WIRE—B. & S. GAUGE.

Diameter B.& S.G'ge.	0000 to No.10	No. 11.	No. 12.	No. 13.	No. 14.	No. 15.	No. 16.	No. 17.	No. 18.	No. 19.	No. 20.	No. 21.	No. 22.
Price per lb	$ 38	38½	38½	0 39	39½	0 40	40½	0 41	0 42	0 43	0 44	0 47	0 52

200 lbs. to 30,000 lbs., 3 cents off list; 30,000 lbs. and over, 4 cents off list.

PRICE LIST FOR GERMAN SILVER IN SHEETS AND ROLLS.

Per cent.	Price per lb.	Per cent.	Price per lb.
12	$0.52	16	.58
13	.53	17	.59
14	.54	18	.60
15	.55		

These prices are for sheets and rolls over 2 inches in width, to and including 8 inches in width and to No. 20, inclusive, American or Brown & Srape's Gauge. Prices are for 100 lbs. or more of one size and gauge in one order. Discount 50 per cent.